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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Public Health Assessment for

WASTE DISPOSAL, INCORPORATED, GROUP
SANTA FE SPRINGS, LOS ANGELES COUNTY, CALIFORNIA
EPA FACILITY ID: CAD980884357
OCTOBER 9, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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PUBLIC HEALTH ASSESSMENT

WASTE DISPOSAL, INCORPORATED, GROUP

SANTA FE SPRINGS, LOS ANGELES COUNTY, CALIFORNIA

EPA FACILITY ID: CAD980884357

Prepared by:

California Department of Health Services
Under a Cooperative agreement with the
Agency for Toxic Substances and Disease Registry

FOREWORD

The Agency for Toxic Substances and Disease Registry, ATSDR, was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as the *Superfund* law. This law set up a fund to identify and clean up our country's hazardous waste sites. The Environmental Protection Agency, EPA, and the individual states regulate the investigation and clean up of the sites.

Since 1986, ATSDR has been required by law to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. (The legal definition of a health assessment is included on the inside front cover.) If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements. The public health assessment program allows the scientists flexibility in the format or structure of their response to the public health issues at hazardous waste sites. For example, a public health assessment could be one document or it could be a compilation of several health consultations the structure may vary from site to site. Nevertheless, the public health assessment process is not considered complete until the public health issues at the site are addressed.

Exposure: As the first step in the evaluation, ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, other government agencies, businesses, and the public. When there is not enough environmental information available, the report will indicate what further sampling data is needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ATSDR scientists evaluate whether or not these contacts may result in harmful effects. ATSDR recognizes that children, because of their play activities and their growing bodies, may be more vulnerable to these effects. As a policy, unless data are available to suggest otherwise, ATSDR considers children to be more sensitive and vulnerable to hazardous substances. Thus, the health impact to the children is considered first when evaluating the health threat to a community. The health impacts to other high risk groups within the community (such as the elderly, chronically ill, and people engaging in high risk practices) also receive special attention during the evaluation.

ATSDR uses existing scientific information, which can include the results of medical, toxicologic and epidemiologic studies and the data collected in disease registries, to determine the health effects that may result from exposures. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances is not available. When this is so, the report will suggest what further public health actions are needed.

Conclusions: The report presents conclusions about the public health threat, if any, posed by a site. When health threats have been determined for high risk groups (such as children, elderly, chronically ill, and people engaging in high risk practices), they will be summarized in the conclusion section of the report. Ways to stop or reduce exposure will then be recommended in the public health action plan.

ATSDR is primarily an advisory agency, so usually these reports identify what actions are appropriate to be undertaken by EPA, other responsible parties, or the research or education divisions of ATSDR. However, if there is an urgent health threat, ATSDR can issue a public health advisory warning people of the danger. ATSDR can also authorize health education or pilot studies of health effects, full-scale epidemiology studies, disease registries, surveillance studies or research on specific hazardous substances.

Interactive Process: The health assessment is an interactive process. ATSDR solicits and evaluates information from numerous city, state and federal agencies, the companies responsible for cleaning up the site, and the community. It then shares its conclusions with them. Agencies are asked to respond to an early version of the report to make sure that the data they have provided is accurate and current. When informed of ATSDR's conclusions and recommendations, sometimes the agencies will begin to act on them before the final release of the report.

Community: ATSDR also needs to learn what people in the area know about the site and what concerns they may have about its impact on their health. Consequently, throughout the evaluation process, ATSDR actively gathers information and comments from the people who live or work near a site, including residents of the area, civic leaders, health professionals and community groups. To ensure that the report responds to the community's health concerns, an early version is also distributed to the public for their comments. All the comments received from the public are responded to in the final version of the report.

Comments: If, after reading this report, you have questions or comments, we encourage you to send them to us.

Letters should be addressed as follows:

Attention: Chief, Program Evaluation, Records, and Information Services Branch, Agency for Toxic Substances and Disease Registry, 1600 Clifton Road (E60), Atlanta, GA 30333.

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Summary

The California Department of Health Services (CDHS) has prepared this public health assessment (PHA) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). The PHA provides the community with information on the public health implications of specific hazardous waste sites and identifies those populations for which further health actions or studies are indicated.

The 43-acre Waste Disposal Inc. (WDI) Site is located in the industrialized City of Santa Fe Springs, Los Angeles County, California. The site is bordered on three sides by paved city streets: Santa Fe Spring Road, Los Nietos Road, and Greenleaf Avenue. St. Paul's High School is located directly northeast of the site. To the east, across Greenleaf Avenue, is a residential neighborhood. The City of Santa Fe Springs is highly supportive of commercial and industrial development in the area and has been seeking to redevelop the WDI Site for industrial land uses.

Activities at WDI began in the mid-1920s with the construction of an in-ground, concrete-lined reservoir with a 42-million gallon capacity. The reservoir was first used for the storage of crude oil (1). In the late 1920s, the site was used for industrial waste disposal (1). Aerial photographs indicate that parcels surrounding the reservoir were excavated and then filled with waste materials. From 1949 to1964 WDI was used as an industrial waste landfill. Wastes disposed at the site include oil-well drilling muds, refinery sludges, pesticides, poly-chlorinated biphenyls (PCBs), organic compounds and metals. In 1966, the site was filled and graded (1). The site is currently subdivided and a number of small businesses have been developed on the property. WDI was proposed for the United States Environmental Protection Agency's (USEPA) National Priorities List (NPL) in May 1986, and added to the list in 1987 (1).

Contaminated waste materials in the reservoir and the buried wastes located adjacent to the reservoir do not pose a current health concern because these areas are covered with five to 15 feet of fill material. There is a 100-square-foot region on the eastern portion of the site (Area 5) that has less than one foot of fill materials covering the subsurface contaminants. The proximity of these contaminants to the surface is of some concern because even shallow excavations could expose people to the contaminants. However, the levels of contaminants in this area are not sufficient to cause a health concern.

Based on available information, CDHS concludes that groundwater beneath the WDI Site is not used for drinking water and that contaminated groundwater beneath the site is likely the result of contamination from properties other than WDI. However, if contaminated groundwater beneath the site were used for drinking water, CDHS would expect a high increased risk of cancer. Available information indicates that there are no private drinking water wells in the vicinity of the site. Therefore, exposure to contaminated groundwater is not likely.

CDHS has identified subsurface soil gas contaminant migration as a completed exposure pathway for workers located on the WDI Site. Volatile organic compounds (VOCs) were detected in subsurface soil gas, in-building air, and background air at WDI. Elevated concentrations of VOCs and methane were detected in soil gas vapor probes and temporary soil

gas probes located near on-site buildings. More than 30 different contaminants have been detected in soil gases at the WDI Site. Chemicals frequently detected in soil gas at the site include vinyl chloride, toluene, tetrachloroethene (PCE), trichloroethene (TCE) and benzene. The most frequently detected VOC in the soil gas samples collected from the vapor wells were TCE and PCE (2). Although soil gas modeling suggests that some soil gas contaminants may be making their way into buildings on the WDI Site, the levels of VOCs detected in the air in these buildings are below occupational health comparison values.

Chemicals used by on-site businesses were inventoried to determine if they could have impacted the in-building air. The inventory showed that the on-site businesses use petroleum-based products and solvents in their operations, which are likely to produce vapors in the buildings. Based on the in-building air monitoring results and the on-site business chemical inventory, it is unlikely that soil gas infiltration from the WDI Site is the primary contributor to the contaminants in the in-building air. Subsurface soil gas results do not indicate migration of soil gas contaminants beyond the WDI Site boundary. Therefore, it is unlikely soil gas contaminants have impacted residents located near the WDI Site or the St. Paul's School.

CDHS has met and interviewed concerned citizens from the community, to gather their health concerns relative to the site. CDHS also spoke with parents and alumni of St. Paul's High School. Health concerns expressed during interviews with community members identified over 60 different symptoms or conditions that people have experienced, including cancer, heart problems, allergies, respiratory problems, cysts/fibroids and blood related problems. Many interviewees commented on the odors in the area. Interviewees also expressed concern about dust blowing off the site into homes and the school.

CDHS-Cancer Surveillance Section (CDHS-CSS) and University of Southern California-Cancer Surveillance Program (USC-CSP) reviewed California Cancer Registry data on the incidence of cancer in Los Angeles County census tract 5029.02. This census tract includes the neighborhood near the WDI Site. The review found many different types of cancers. However, neither the cancer types diagnosed, nor the age at which diagnoses occurred, were different from what would be expected compared to California as a whole.

The responsible party, Waste Disposal Inc. Group (WDIG) characterized the quantity and location of wastes at the site in the Supplemental Feasibility Study, released in May 2001. In June 2002 the USEPA completed the Amended Record of Decision for the site. The major components of the revised remedy include capping the reservoir and portions of Areas 1, 2, 4, 5, 6, 7 and 8, installation of gas and liquid collection and treatment systems and engineering controls to prevent exposure to site contaminants. In addition, long-term groundwater monitoring, operations and maintenance and site review will occur at the site. The Final Remedial Design for the site was approved by USEPA in June 2003. The final remedial design included a cap over wastes in the reservoir and areas outside the reservoir, improved surface water drainage, collection and treatment of soil gas contaminants as well as monitoring of groundwater, soil gas and indoor air. The WDIG is currently preparing their workplan and health and safety plan for the site.

Based on the available information, CDHS and ATSDR conclude that the WDI Site currently poses no apparent health hazard to those who live near it. However, the WDI Site does pose an indeterminate historical health risk for people that worked or lived in the area prior to the grading and backfilling of clean fill in 1966. Buried on-site wastes present an indeterminate health hazard due to potential future health risks should the site be excavated and buried wastes exposed. Groundwater contamination in the vicinity of the WDI Site also presents an indeterminate health hazard due to potential future health risks, if these contaminants get into the municipal water supply and no corrective measures are taken.

As a part of this PHA, CDHS made several recommendations to the USEPA to prevent or minimize current and future health risks at the WDI Site including: ensuring the cap adequately covers the waste materials on the site; restrictions on future site development to prevent exposing contaminants; groundwater monitoring; ambient air monitoring and dust and erosion controls.

Background

This PHA was prepared by CDHS under a cooperative agreement with ATSDR. In this document, CDHS and ATSDR will assess whether health effects are likely to occur because of exposure to site contaminants, and will recommend actions to reduce or prevent possible adverse health effects. ATSDR, located in Atlanta, Georgia, is a federal agency within the United States Department of Health and Human Services, and is authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, known as Superfund Legislation, to conduct PHAs at hazardous waste sites. The conclusions of this PHA for the WDI Site are based on a review of available environmental data, community concerns, information obtained from site visits, and consultation with involved agencies and the public.

The USEPA added the WDI Site to the NPL in 1987. The NPL informs the public about hazardous waste "Superfund" sites that warrant further investigation to determine if they pose risks to public health and/or the environment.

Site Description and History

The 43-acre WDI Site is located in the highly industrialized City of Santa Fe Springs, Los Angeles County, California (Figure 1). The WDI Site is bordered on three sides by paved city streets: Santa Fe Spring Road to the northwest; Los Nietos Road to the southwest; and Greenleaf Avenue to the southeast. St. Paul's High School is northeast of WDI. The school's athletics fields and parking lot abut the site. To the north of the site is the Fedco Food Distribution Center, consisting of one large warehouse, a water tank, and a storage yard surrounded by a 10-foot-high cinder block fence. The nearest residences are located approximately 100 feet east of the boundary of the WDI Site.

Little documentation exists on details of operations at the site prior to the late 1940s (1). Activities at the site began in the mid-1920s with the construction of an in-ground, concrete-lined reservoir with a capacity of 42-million gallons (1) and a diameter of approximately 600

feet. The reservoir was first used for the storage of crude oil (1). In the late 1920s, the site was used for industrial waste disposal (1). Aerial photographs indicate that parcels surrounding the reservoir were excavated. These unlined excavations, or sumps, were then filled with waste materials. Several of these waste sumps have been identified. Aerial photographs from 1937 and 1945 show rough outlines of discrete areas of the WDI Site, some of which were used as waste disposal areas (Figure 2). These waste sump areas have been roughly divided into eight areas for descriptive purposes (Figure 3). There are 18 liquid extraction wells installed in the reservoir. These wells are installed approximately 25 to 30 feet below ground surface (bgs) or one foot above the base of the reservoir. The liquid is extracted from the reservoir and transported via double lined piping to the main liquid treatment unit. The liquid flows through the oil/water separator unit. Next, the separated water goes through the carbon treatment unit which filters contaminants from the liquid. The filtered liquid is temporarily stored in the large steel tank. A sample is collected and analyzed to ensure that the liquid meets USEPA's non-hazardous water criteria. Then, the non-hazardous liquid is transferred into a large Baker tank. The non-hazardous liquid is removed by Crosby & Overton and disposed off-site at an USEPA approved facility in Long Beach, California. Because only a small amount of oil has been extracted from the liquid, it is currently being stored in a small Baker tank near the oil/water separator.

In 1949, the operators at WDI received a permit from Los Angeles County to operate an industrial waste landfill (1). Industrial waste disposal activities continued until 1964. The majority of wastes disposed at the site were oil-well drilling muds, refinery sludges, and other industrial waste by-products, including: pesticides, PCBs, VOCs, semi-volatile organic compounds (SVOCs) and metals (3). Since the 1940s, the property has been subdivided, and a number of small buildings were built on the site (1). In 1966, the reservoir and sump areas were filled and graded (1).

The City of Santa Fe Springs conducted a preliminary assessment of the site in December 1984 (1). The assessment referred to existing contamination and noted the importance of the drinking water aquifers beneath the site (1). For these reasons, the WDI Site was proposed for USEPA's NPL in May 1986 (1).

ATSDR released a Preliminary PHA of the WDI Site on November 11, 1988. ATSDR concluded that the site was a potential public health concern because of the risk to human health caused by the potential exposure to contaminated soil (4). ATSDR recommended that further groundwater and off-site soil analysis be conducted (4).

In 1988, USEPA's contractor, Ebasco, began the Remedial Investigation/Feasibility Study (RI/FS). Ebasco collected soil, groundwater, and soil gas samples and analyzed them for VOCs, SVOCs, pesticides, PCBs, and metals. In August 1993, the Proposed Plan for Contaminated Soils and Subsurface Gases was released to the public (4). The results of the RI/FS process are summarized below:

- The reservoir and contaminated material are best left in place and capped. Borings indicated that the reservoir is structurally sound;
- Areas outside of the reservoir impacted with chemicals of concern, if any, could be

excavated from under the capped area and buried in the reservoir;

- Subsurface gases include methane and trace amounts of other organic compounds, with highest concentrations in the reservoir area;
- Surface emissions are below action levels, so a passive venting system may be adequate;
- Groundwater beneath the site is not used as a drinking water source.
- Monitoring results show that activities at WDI have not impacted the groundwater;
- The health risk assessment indicates that the risk is presently low, below USEPA's risk acceptance criteria; and,
- Future development of the site is permissible with deed notices and/or restrictions (3).

In 1993, the CDHS issued a Revised Site Review and Update (SRU). The conclusions of the SRU are summarized below:

- The contaminated soil does not appear to pose an adverse health impact;
- USEPA's preferred alternative of limited excavation and consolidation under a Resource Conservation and Recovery Act (RCRA)-equivalent cap; and institutional controls should prevent exposure to contaminated soils unless someone disturbs the fill that covers the reservoir;
- The drinking water is not impacted by the contaminated soil, but further study of the groundwater is needed; and,
- Soil gas may pose a long-term health concern to the employees working in the commercial buildings located along the perimeter of the WDI Site (4).

In December 1993, USEPA signed the Record of Decision (ROD) which included the preferred remedy to address the contaminated soil and subsurface gases at the WDI Site. USEPA determined that the preferred remediation activities for the WDI Site were: excavation of contaminated soils, capping over consolidated excavated soils, gas venting and treatment (if necessary), institutional controls, and long-term monitoring. The work is being performed under an Unilateral Administrative Order issued by USEPA to the Waste Disposal Inc., Group (WDIG) which includes: Archer Daniels Midland; ARCO; Atlantic Oil Company; Bethlehem Steel; Chevron Corporation; Conoco, Inc.; Conopco; DiLo, Inc. (successor to the DiaLog Company); Dresser Industries, Inc.; Exxon; Ferro Corporation; FMC Corporation; Hathaway; Monterey Resources (formerly known as Santa Fe Energy Resources Inc.); McDonnell Douglas; Mobil Oil Corporation; Santa Fe International Corporation; Shell; Texaco Inc.; Union Pacific Railroad; and the Union Oil Company of California (5).

During June to September 1995, the design phase of the remediation activities was initiated by WDIG to refine the proposed site remedy. The results of the field activities are summarized below:

- A surface gas emissions survey determined that a cap is only needed over the reservoir;
- Site borings determined that the areas outside the reservoir do not exceed USEPA's cleanup standards, and therefore do not need to be excavated;
- Groundwater sampling determined that WDI was not impacting the groundwater; and

- Subsurface gas sampling determined that the subsurface gas was not migrating beyond the limits of the site (6). One small area of the southeast corner (Area 7) requires additional extraction testing for subsurface gas (6).

In October 1995, WDIG submitted a pre-designed/intermediate (60%) Design Report, Soils and Subsurface Gas Remedial Design (RD) to USEPA (7). In this report, WDIG reported:

- Groundwater beneath the site is not impacted;
- Chemicals in the soils outside of the buried reservoir are below excavation requirements;
- Subsurface gas concentrations are essentially as USEPA measured; and,
- Methane at ground surface is barely detectable. Extremely low concentrations are within background concentrations for the area.

As a result of these findings, the following actions were recommended:

- A 6-acre multilayer cap be constructed over the reservoir;
- The installation of a passive gas control/venting system beneath the cap and a soil gas monitoring system;
- Grade Areas 2, 3, 4, and 7 to improve drainage;
- Plant vegetation to provide erosion protection and aesthetic improvements;
- Implement deed notices and restrictions; and,
- Special landscaping at the northeast corner of the site to screen the adjacent school and residences, plus a high fence to obstruct the entry of balls from St. Paul's High School's athletic fields (6).

Beginning in 1997, WDIG carried out additional RD activities in accordance with USEPA's Amended Administrative Order, Docket 97-09 (2). These activities included investigations throughout the WDI Site. As a part of these efforts, a liquid extraction system was installed to remove infiltrated rainwater and previously disposed liquid wastes from the WDI reservoir. This system extracts contaminated water from 18 wells installed in the reservoir. Contaminated liquids are extracted, separated and sent through a carbon filter. The treated water is then put in a storage tank for off-site disposal.

In 1999, the Groundwater Data Evaluation Report (8) concluded that significant impact on groundwater has not been identified from the site based on available sampling results. Also in 1999, the USEPA's Subsurface Gas Contingency Report concluded that VOCs detected during monitoring may be due to the onsite business chemical inventories developed by USEPA (9).

In May 2001, TRC Environmental Solutions, Inc. (TRC) prepared the Supplemental Feasibility Study (SFS) for the USEPA. This study found:

- The extent of the buried waste to be greater than what was thought at the time of the 1989 ROD and the 1995 Pre-design. However, the nature of these contaminants was consistent with previous findings (10);

- Buried wastes exist under 11 buildings or structures at the WDI Site;
- Reservoir liquids/leachate contain CERCLA hazardous substances, including constituents at levels which may exceed Resource Conservation and Recovery Act (RCRA) hazardous criteria;
- Although the concrete bottom of the reservoir may not be intact in several areas, the contamination has not spread downward to groundwater;
- In-business air monitoring conducted by USEPA in August 1997, and by WDIG since February 1998, has not demonstrated soil gas infiltration into the onsite businesses above action levels;
- WDIG has completed several rounds of in-business air monitoring since 1998, which have confirmed EPA's initial conclusions that soil gas infiltration has not been observed;
- Reservoir vapor well testing indicated that the reservoir may contain high levels of methane and VOCs, as shown in EPA's high vacuum extraction testing. However, the high vacuum tests clearly indicate that the actual mass of methane and VOCs is limited;
- Several contaminants of concern (COCs) have been detected above their respective MCLs in the groundwater samples at the site. However, these exceedances do not appear to be related to the site wastes based on their distribution in groundwater (e.g., some contaminants are detected upgradient or crossgradient from site waste sources);
- The site is situated in a heavily industrialized area and the production of oil from Santa Fe Springs Oil Field has been ongoing since the early 1900s;
- Upgradient and cross-gradient of the site are several properties that have had confirmed solvent (PCE and TCE) releases; and,
- The VISTA Information Solutions, Inc. Site Assessment Report identified a total of 150 sites within 1.25 miles of the site included on various agency lists and inventories.

In June 2002 the USEPA completed the Amended Record of Decision (ROD) for the Waste Disposal Inc., Superfund Site. The Amended ROD presents the selected remedial action for the WDI Site. The original ROD for the site was singed on December 27, 1993. The original ROD was amended because of information that became available after the initial ROD was signed. Specifically, the expanded lateral extent and volume of buried waste on the site, the nature and extent of soil gas beneath the site and the presence of liquids in the buried reservoir.

The major components of the revised remedy include:

- Installation of a RCRA-equivalent cap over the reservoir;
- Installation of an engineered capping system for selected portions of Areas 1, 2, 4, 5, 6, 7 and 8;
- Installation of a gas collection, extraction and treatment system for gases in the reservoir;
- Installation of a liquids collection system for liquids in the reservoir;
- Use of engineering controls (e.g., venting or physical barriers) to prevent exposure to site contaminants;
- Installation of passive or active soil gas extraction/control systems in areas outside of the reservoir that are near existing buildings;
- Implementation of institutional controls such as restrictive covenants or zoning ordinances to minimize potential for exposure to residual hazardous wastes;

- Implementation of long-term groundwater monitoring;
- Implementation of long-term operations and maintenance to assure systems function properly; and,
- A site review will occur at least once every five years.

The final design report - Soils, Subsurface Gas and Groundwater Remedial Design was released in March 2003. The selected remedy included installation of a RCRA SubtitleC-Equivalent cap over the reservoir and a RECRA Subtitle D-Equivalent cap over other waste on the site. Other remedial activities included in the final report were surface water management systems, soil gas control systems, leachate monitoring and control systems, soil gas, groundwater and indoor air monitoring systems. The Final Remedial Design for the site was approved by USEPA in June 2003 and the WDIG is currently preparing their workplan and health and safety plan for the site.

Site Visit

On August 12, 1999, CDHS staff conducted a site visit and met with a representative from TRC Environmental Solutions, Inc. (TRC). The WDI Site is surrounded by a steel chain-link fence. There are six warning signs (both in English and Spanish) posted on the front gate (near the corner of Greenleaf Avenue and Los Nietos Road). There are businesses on the site, located along Santa Fe Springs Road, Los Nietos Road and on Greenleaf Avenue (Brother's Machine Tool) in addition to the St Paul's High School. The nearest residential area is approximately 100 feet east of the site, located across Greenleaf Avenue.

During the site visit, CDHS personnel observed a liquid extraction system located near the front entrance of the WDI Site. The purpose of the liquid extraction system is to remove infiltrated rainwater and previously disposed liquid wastes from the reservoir. This system consists of an oil/water separator unit, a carbon treatment unit, three tanks, liquid extraction wells, piping, and an air compressor. The liquid extraction system is connected to an alarm system that automatically alerts two designated technicians from TRC if the system malfunctions.

The WDI Site appeared parched and dry during the site visit. According to the TRC representative, the grass was mowed and allowed to die down to prevent the site from becoming a fire hazard. Scattered throughout the WDI Site are short tufts of weeds. The site is approximately 15 feet above the surrounding terrain because fill material was brought in to cover the reservoir. A berm has been constructed in front of the steel fence which separates the WDI Site from St. Paul's High School. The berm channels surface water from the WDI Site into a drainage ditch located on Greenleaf Avenue. Also, the site has been graded to prevent surface water runoff from impacting on-site businesses.

In December 2000 and January 2003, CDHS staff conducted a cursorial site visit. Purpose of the site visit was to inspect site activities, site boundaries and abutters. Site conditions during this site visit appeared to be similar to conditions of the previous site visit.

Demographics, Land Use, and Natural Resources

Demographics

Based on the 1990 census, approximately 14,356 people live in the City of Santa Fe Springs. The ethnic makeup is 66% Hispanic; 27% Caucasian; 5% Asian or Pacific Islander; 2% Native American; 1% African American; and 0.13% other races (11). In 1990, 30% of the total population was under the age of 18, and 12% was over the age of 65 (11).

Although the WDI Site is located in Santa Fe Springs, the site is very close to neighborhoods in Whittier. Based on the 1990 census, approximately 23,805 people live in the City of Whittier (6). The ethnic makeup is 52% Hispanic; 11% Caucasian; 3% Asian or Pacific Islander; 1% African American; 0.3% American Indian, Eskimo, or Aleut; and 32% other race (11). In 1990, 29% of the total population was under the age of 18, and 12% was over the age of 65 (11).

Land Use

The WDI Site is zoned M-2, heavy manufacturing. The City of Santa Fe Springs is highly supportive of commercial and industrial development in the area and has been seeking to redevelop the WDI Site for industrial land uses(12). There are approximately 24 small businesses located within the WDI Site boundaries, primarily along Santa Fe Springs Road and Los Nietos Road (Figure 1). The Fedco Food Distribution Center (a warehouse) and Saint Paul's High School are located adjacent to the WDI Site to the north and northeast. The southern boundaries of St. Paul's High School and Fedco are separated from the WDI Site by a steel chain-link fence. There is a recreational vehicle storage lot in the northwestern portion of the site. Residential areas are located approximately 100 feet east of the site, across Greenleaf Avenue.

Natural Resource Use

Site Topography and Geology

The surface elevation of the WDI Site is approximately 160 feet above mean sea level (12). The reservoir portion of the WDI Site is 10 to 20 feet above the surrounding terrain (12). The western and southwestern portion of the site is fairly level. However, the northeastern portion of the site drops away at a 30 to 50 % slope and the southeastern portion of the site drops away at a 10 to 30 % slope (12). Thus, in general, surface water drainage occurs in these two areas.

The entire WDI Site is covered by five to 15 feet of fill material with the exception of an approximately 100 square-foot region of Area 5 where only about 1 foot of fill exists. Beneath the fill material is a silt layer ranging from 10 to 25 feet that extends across the entire WDI Site (12). Below the silt layer is a sandy and pebbly layer that is at least 50 feet thick.

Groundwater

The WDI Site is situated in the Whittier Area of the Central Groundwater Basin (12). The water-bearing zones, which extend to a depth of about 1,000 feet, include the Lakewood and San Pedro Formations. Within the Lakewood Formation, there are three water-bearing zones, in increasing depths: Bellflower Aquiclude, Artesia Aquifer, and the Gage Aquifer. The Gage Aquifer, which is 150 feet deep and 30 feet thick, is the major water-bearing zone of the Lakewood Formation in the Whittier Area.

The WDI Site is situated above the Bellflower aquiclude (70 feet deep and 10 to 40 feet thick). The Bellflower aquiclude is approximately 20 to 25 feet below the bottom of WDI's buried reservoir (3). Generally, the site has approximately 25 feet of fill and waste materials in the upper soils. Beneath the fill materials is a layer (approximately 50 feet thick) of sandy, pebbly, river (fluvial) deposits. From approximately 80 - 130 bgs is a layer of interbedded sand and pebbly sand. Although local low-conductivity layers occur throughout the site, a laterally extensive and continuous confining bed has not been identified either above or below the groundwater table (12)

Groundwater has been encountered at depths of 48 to 65 feet bgs at the site (12). Groundwater appears to flow southeast on the southeastern portion of the site and radially southwest on the southwestern portion of the site (12).

Drinking Water

In 1989 Ebasco conducted a groundwater characterization report that described hydrogeology and known groundwater well information in the area (12). This report identified five municipal supply wells, owned by Santa Fe Springs, in the vicinity of the site. In 1989, four of these wells were functional.

Ebasco located seven private wells in the area. However, information on these wells is limited. Five of the seven wells had unknown status as of the 1989 report. One well, owned by Southern California Edison, was reportedly abandoned. This well is reported to be located 600 feet west of WDI. One well, reportedly owned by a citizen, was listed as being capped in 1957, but active as of 1979. This well is reportedly located 775 feet southeast of the WDI Site. Two of the remaining wells were identified as being located approximately 500 feet west of the site. One well was identified as being located approximately 1,000 feet south of the site. Another well, reportedly owned by the Whittier Union High School District, was located approximately 3000 feet east of the site and used for domestic and irrigation purposes. One well, reportedly owned by the Texas Oil Company, had no identification information except that it had a total depth of 55 feet. No wells in the vicinity produce water from the shallow groundwater zone that underlies the WDI Site (12).

The U.S. Army Corps of Engineers prepared a Groundwater Report in January 1999 (8). This report located seven water supply wells in the vicinity of the WDI Site. Two municipal water supply wells are located within 2 miles of WDI. One of these wells (DWR #02/11W-30R3S) is

located approximately 1 mile northwest of WDI. This well is active and is operated by the City of Santa Fe Springs. The other well is inactive and located approximately 1.4 miles west of WDI. The City of Santa Fe Springs municipal wells are completed to depths between 200 and 900 feet bgs (12). The U.S. Army Corps of Engineers found little additional information pertaining to the other wells in the area, except that they corroborated with the Ebasco report that the well owned by Southern California Edison was abandoned.

The City of Santa Fe Springs purchases approximately 82% of its municipal drinking water from the Metropolitan Water District. The Metropolitan Water District's water source is a "blend" of surface water from the Colorado River and the State Water Project, which receives water from the upper Feather River Basin in northeastern California. The remaining 18% of Santa Fe Springs' municipal water is provided by two active municipal groundwater wells: Well #1 (# 02/11W-30R03S) located at 8634 Dice Road; and Well #2 (#03S/11W-20R09S) located at 15517 Carmenita Avenue, both in the City of Santa Fe Springs.

Before the water is distributed to the public, the water must meet the standards mandated in the California Health and Safety Code, Title 22. The drinking water supply is monitored for VOCs, non-volatile synthetic organic chemicals (SOCs), and inorganic chemicals such as metals and radiological parameters (Table 1). In addition to the chemicals regulated under Title 22, the CDHS Drinking Water Field Operations Branch monitors for unregulated chemicals in the City of Santa Fe Springs municipal water system (Table 2).

According to Title 22, water purveyors must follow a specific monitoring schedule and the concentrations of regulated contaminants detected in the drinking water may not exceed the Maximum Contaminant Level (MCL). The MCL is the maximum permissible concentration of a contaminant that the USEPA will allow in a municipal drinking water.

In the Supplemental Feasibility Study, produced in 2001, there is another review of agency records which found seven water supply wells located near the site. According to personnel from the City of Santa Fe Springs, only two municipal water supply wells are located within 2 miles of the site. One well (WW-1) is located upgradient of the site, approximately 1 mile to the northeast. This active well is owned by the City of Santa Fe Springs. The second well (WW-2), which is inactive, is also owned by the City of Santa Fe Springs and is cross-gradient to the site, approximately 1.4 miles to the west (10).

Health Outcome Data

One source of existing health-related data in California is the California Cancer Registry (CCR). The CCR is California's statewide population-based cancer surveillance which collects information about most cancers diagnosed in California residents after January 1, 1988 (13). The CCR uses this information to further their understanding of cancer occurrence and to develop strategies and policies for its prevention, treatment and control (13). In response to concerns raised by community members living near the WDI Site, CDHS-Cancer Surveillance Section (CDHS-CSS) and the University of Southern California-Cancer Surveillance Program (USC-CSP) reviewed the CCR Registry data on the incidence of cancer in Los Angeles County census

tract 5029.02. This census tract encompasses the neighborhood where the concerned community members reside. This review determined that cancer rates in the vicinity of the WDI Site are similar to rates in Los Angeles County as a whole. The health outcome results based on this review are summarized in the Public Health Implications section of this document.

Community Health Concerns

Background

The WDI Site first received attention from the community in July 1958. At that time a group called "The Committee Against Waste Disposal, Inc." sent a series of telegrams to officials in Los Angeles County. The committee requested the suspension of Waste Disposal's operation, asserting the landfill emitted foul odors and was related to residents' health problems. Excessive noise and dust were other problems that the local officials claimed were related to the site (14). CDHS has recommended that USEPA incorporate dust control efforts in future work on the site (see recommendation #6).

The next organized community effort occurred in 1984 and 1985 after the City of Santa Fe Springs began to investigate the site. The City of Santa Fe Springs initiated soil sampling at the WDI Site because they were interested in developing the area, and had received notice from CDHS that hazardous materials had been deposited on the site in the past. Media coverage featuring pictures of the landfill with the St. Paul's High School playing field in the background raised the awareness of the public, especially the parents of St. Paul's students. By early 1985, an action committee was formed by a group of St. Paul's parents who requested that CDHS conduct a health survey to investigate if there was a relationship between the community's health problems and the hazardous substances present at the WDI Site (14). A health survey was not conducted. However, letters from St. Paul's parents to local members of Congress resulted in the posting of signs warning people not to enter the WDI Site.

In July 1987, community interest surfaced again when the WDI Site was listed on the USEPA's Superfund NPL (14). The South Whittier Community Coordinating Council (a quasi-governmental coordinating body representing citizens from South Whittier, the utility company, and representatives from various city departments) received a briefing from the City of Santa Fe Spring's Director of Environmental Management about the site and the NPL listing (14). Community members had little knowledge about the contamination and were concerned about releases from the WDI Site contaminating the air and water. Although the main health concern was related to the safety of the drinking water, several residents raised questions about whether exposures from the site could cause cancer.

Between 1988 and 1993, USEPA studied the conditions at the WDI Site and analyzed alternatives for addressing the contamination. In an August 1993 fact sheet, USEPA presented the community with its proposed plan to address the contamination at the WDI Site. Several alternatives were presented with the preferred USEPA alternative being an asphalt cap with a plastic liner to cover the reservoir and some adjacent areas of contamination (1). In addition,

there was a plan to do limited excavation of contamination from other areas of the site, and to place the contaminated soil from these excavations beneath the cap. Some St. Paul's parents expressed discontent with the plan. Parents wanted to know if large remediation equipment would raise clouds of contaminated dust that would adversely impact students using the playing fields daily during the football season. USEPA reported that the three major concerns gathered during the public comment period were health concerns and site risks, aesthetics and future land use, and the effectiveness of the proposed cap, especially for students at St. Paul's High School (15). USEPA informed the community that the WDI Site did not pose a current health risk. Also, the installation of an asphalt cap with a plastic liner over the contamination would prevent future exposure (15).

In 1996, an article in the Whittier Daily News reporting little community interest in the cleanup plan for the site resulted in the formation of a community group, Protect Our Neighborhood Committee (PONC), representing the neighbors living across Greenleaf Avenue from the WDI Site. Due to an oversight in USEPA's mailing list, many residents in South Whittier, which includes the neighborhood with many PONC members, had never been involved in the discussions about the proposed cleanup plans for the WDI Site. PONC organizers were angered that they had not been included in the USEPA process and responded by distributing a petition to their neighbors alerting them to site clean up plans at WDI. PONC also initiated an informal survey identifying the number of cancer cases in the neighborhood. PONC's position was that a cap was not adequate protection and that contaminated soil should be removed from the site. The purpose of the survey was to convince USEPA of the unexpected number of cancer cases in the neighborhood. A CCR review of the data on cancer cases in the census tract including this neighborhood concluded that the incidence of cancer in this neighborhood was similar to that of Los Angeles County as a whole (see Health Outcomes Section).

The leaders of PONC criticized the findings of the CCR data review as being diluted by not focusing on their neighborhood, and continued with their own community-based survey. Their survey inquired about the number of years living at the address, the number of persons living at the address, and the number of persons over age 18 at that address. There was a question inquiring about health-related problems and asking respondents about 15 different health problems including allergies, cancer, dizziness, leukemia, shortness of breath, asthma, convulsion, chronic headache, liver problems, frequent sore throat, birth defects, chronic cough, kidney problems, seizures and tumors, as well as other health concerns. Ten neighborhood volunteers interviewed 270 households in a 2-month period. CDHS made several unsuccessful attempts to obtain a copy of the community-based survey from the leaders of PONC.

In September 2002, CDHS released a public comment version of this public health assessment. Public comments were received until December 2002. Comments received and CDHS's responses are in Appendix D.

CDHS Involvement

In the summer of 1998, CDHS started a PHA process to update a 1993 CDHS review of the site data. The purpose of the PHA was to evaluate the studies being conducted by USEPA to ensure

that nearby businesses and residents were not being exposed to contaminants from the site. Since the PONC group still had many concerns about the site cleanup and health issues, USEPA enlisted the help of a group called Technical Outreach Services for Communities (TOSC) to provide technical assistance to the residents in interpreting technical documents. The TOSC representative met with the community several times and learned that there were many health concerns. CDHS suggested doing a more extensive community concerns section within the PHA because the data does not support a formal health study. This would entail informally interviewing concerned citizens from the community about health concerns, odors or other possible exposures. The purpose of the informal survey was to get a general understanding of the health concerns in the neighborhood and to provide a mechanism for having these concerns documented in a public report.

Informal Survey Process and Health Complaint Categories

PONC leaders were open to the idea of conducting the informal interviews as a way of getting an understanding of overall community health concerns. PONC distributed flyers in the community announcing a meeting on the night of February 11, 1999. CDHS, USEPA, and TOSC staff met with approximately 25 people from the community to explain the PHA process and learn if the community thought that informal interviews would be a helpful way to gather health concerns information. There was a lengthy discussion about the purpose of the community health concerns section and the difference between our informal interviews and a health study. Overall, the community reacted positively to the informal interview process.

Between March 9 and March 11, two CDHS staff and the TOSC representative interviewed 20 community members. Four people were interviewed by telephone at a later date. As part of CDHS' informed consent process, CDHS explained that the health concerns were being gathered to document community participation and concerns. The PONC representatives scheduled all the appointments for the interviews. The interviewers began by describing their various roles, the role of ATSDR, the PHA process, and the purpose of doing the interviews. The interviews were open-ended but the main information CDHS and TOSC were seeking were health concerns, odor complaints possibly related to the site, and any other concerns about possible exposures from the site, such as dust or surface water runoff. The interviewers were careful to clarify that this was not a formal health study that would link health complaints with exposure to site-related chemical contaminants. It was explained that this survey was a tool for gathering information informally about the types of health concerns expressed by the community and which concerns were mentioned most frequently. In addition, incorporating the information obtained from the informal interviews in the PHA would be a way to record these concerns in a public report.

Interviewees reported on symptoms and conditions experienced by themselves, family members, and/or neighbors. The 24 interviews yielded information on approximately 130 individuals. There were over 60 different types of symptoms/conditions that were mentioned during the interviews. In order to organize the information, the interviewers have grouped the individual listings together in various categories. These categories include: cancer, heart-related conditions, allergies/chronic colds/ear infections, respiratory problems, endocrine system conditions, cysts/fibroids, and blood related problems.

Cancer was mentioned 19 times during the interviews with 12 different kinds of cancer being identified. The most common types of cancer were prostate, breast, and lung cancer. The other cancers included stomach, colon, bone, ovarian, oral/tongue, uterine, leukemia, esophageal, and skin cancer.

Heart-related conditions were mentioned 24 times. These included eight heart attacks, nine people with high blood pressure, three heart surgeries, one person with heart arrhythmia, and one with mitrovalve prolapse.

The category of allergies included complaints of nasal problems, sinusitis and eye irritations. In addition, 20 people reported that they or their family suffered from "general" allergies. Also, four people complained of frequent colds and ear infections in their family members. The respiratory complaint category included complaints of general respiratory problems (noted four times), asthma (21 times) and emphysema (one case reported). Eight people noted frequent headaches and two specifically said that they or their family members had migraines.

The endocrine system which controls the hormone production in the body was another category. Different types of thyroid disorders such as hyperthyroidism (too much production of thyroid hormones) and hypothyroidism (too little production of thyroid hormones) were each mentioned several times. In addition, four people had thyroid tumors and one had her thyroid removed. Seven people had a diagnosis of diabetes. Chronic fatigue syndrome and low energy were other health complaints which were also included in this category.

Cysts (sacs containing liquid material) and fibroids (tumors composed of fibrous tissue) were another grouping of complaints that were more commonly listed. Eight people had fibroid tumors.

The last overall category relates to the blood system. Several people had elevated white blood cell count or low white blood cell count. In addition, people mentioned having anemia and low platelets. The rest of the health problems did not readily fit in any category. The remaining health problems which were mentioned more than two times were arthritis, gall bladder problems, and hysterectomies.

During the interviews, people also discussed health problems related to their pets. Three people noted that their dogs died unexpectedly at an early age. Two dogs had tumors, one had leukemia and another had problems with asthma. Another woman said that her three dogs all had cancer and had to be put to sleep but that only one of them played at the site.

Odor and Exposure Complaints

In addition to health concerns, the interviewers inquired about odors or any possible exposures from the site that concerned the residents. Most of the odor complaints were not specifically identified with the site. However, one person said that odors emitted from the Waste Disposal site smelled like rotten eggs, gas and oil. There were a number of people who complained about odors in the past, especially from the mid-1950s through the 1970s. Respondents described odors

by comparing them to the smell of spoiled cabbage, skunk, rotten eggs, something rotting, rotten brussels sprouts, dank rotten oil, sulfur, garlic/onion, collard greens, something sickly sweet, musty natural gas, and raw oil. Several people used the word putrid and said that during the periods of strong odors they could not remain outdoors and had to come inside and close their windows and doors. Others said that the chemical smells made them nauseous and one person reported that as a child the odors made her choke and her eyes run. Those who noted odor complaints felt that strong odors were more common in the summer and late in the evening. Several people commented that in the past they had to keep their windows closed most of the summer.

About a third of the respondents identified Powerine as a source of the foul odors. Powerine was a oil refinery that operated in the vicinity of the site. Although one person said the closing of Powerine (in 1995) did not make a difference, several people felt that the odors were much improved since the closing. These people were disturbed to learn that there were plans to re-open the refinery. Oil and rotten egg (sulfur) smells were most commonly associated with Powerine. One respondent reported that a 1990 explosion at Powerine resulted in an oily material covering the surface of their car. There were also complaints of odors in other areas of Santa Fe Springs. One person reported refinery odors off Florence Avenue during the summer several years ago. Another reported strong chemical smells on Telegraph Road. There were several specific events that resulted in odor observations. One person complained about a horrible smell in the fall of 1998 that resulted in an immediate, extreme headache unlike anything she had experienced. One person commented that after the Whittier Earthquake, the odors were more penetrating. Two people added that there appeared to be a chlorine gas cloud or some type of fumes which were visible after the earthquake and were different than anything they had seen before.

Respondents were also asked to identify if there was anything coming from the site that concerned them. Dust coming from the site was a common complaint. Since the grass has been planted, the situation has eased. One person reported that there was white-looking powder on the site. One person reported that several years ago, there were substantial amounts of dust coming from the site. The dust issue seemed to have the most effect on residents across the street from the WDI Site (east of Greenleaf Avenue). Grading of topsoil was reported to result in a film of dust on the cars and mowing the weeds also created dust. Others reported that oil and a sooty-like material would stick to their windows. Several people reported that during heavy rains within the last few years, sheets of water would run off the site and cause overflow of the storm water drains, resulting in flooding along Greenleaf Avenue. Some reported that an oily sheen would be visible on top of the water during rain events. During heavy rains, the streets would be flooded between Greenleaf Avenue and Painter Avenue making Barton Road impassible. Barton Road constitutes the southern edge of the residential community to the east of the WDI Site.

Several people reported that when they were children, they played on the site with their friends. They rode their bikes on mounds of dirt in an area called "Rabbit Hill". There was a pond on the Los Nietos side of the site that contained dirty, oily water. On the St. Paul's High School side of the reservoir, there were low lying areas where puddles would form of oily water containing polliwogs. In some of the muddy and oily areas, children could get wet up to their knees. They reported getting filthy when they played on the site and had to wash the oily liquid off their dogs.

Several people said that they rescued ducks and birds from the site that were unable to fly because they had oil on their feathers. Currently, opossum, rats, and rabbits inhabit the WDI Site. One person said that she found dead fish in the pond. Also, a plastic resin-like material has been dumped on the ground at the WDI Site. As a result, after children rode their bicycles and played on the WDI Site, their clothes and bicycles would be covered with the plastic resin-like material.

Health Concerns of St. Paul's Students and Parents

In addition to neighbors across the street from the site, CDHS also spoke with parents and alumni of St. Paul's High School. The school printed a paragraph describing CDHS activities in both the Principal's newsletter to the parents and the Alumni newsletter. USEPA also referred several callers to CDHS. Staff ultimately interviewed four alumni (classes of 1980, 1981, 1988, and 1992) and two parents of St. Paul's High School students. One parent had a child who graduated recently, and another parent had five children who attended St. Paul's between the early 1970s and the early 1980s. The parent of the recent graduate was extremely concerned about the quality of water at the school when her child was attending St. Paul's High School. Table 1 provides an overview of municipal water sampling required by drinking water purveyors. CDHS has reviewed the 2002 Water Quality Report for Sante Fe Springs (28b) and concludes that there were no contaminants detected in the municipal water drinking system above their respective MCLs.

The rest of the interviewees expressed a variety of health concerns about themselves, their classmates, or their children. Several people noted that among their classmates there seemed to be a large number of miscarriages and among the children there appeared to be an unusual number of birth defects and developmental problems including mental retardation. According to one mother of a child with cerebral palsy, her child's physician inquired about the child's environmental exposure history. Testicular, prostate, melanoma, and breast cancer were reported as being common, especially for alumni who had attended St. Paul's in the 1970s and 1980s. Two people reported having tumors on the spine. Cysts on various parts of the body (spine, ovary, cervix, hands) were commonly reported. Hypothyroid and hyperthyroid conditions seemed to be common among members in several classes. Two people mentioned that they have goiters. Several people said they had lupus and were tired much of the time.

CDHS suggested doing a community concerns survey because the data does not support a formal health study. The purpose of this survey was to better understand the health concerns of the community and to document those concerns in a public report. Residents and parents of school children interviewed identified over 60 different health concerns ranging from cancer to thyroid problems to odor complaints.

Environmental Contamination and Other Hazards

Because the WDI Site is located in a heavily industrial area, the businesses both on the WDI Site and in the vicinity of the WDI Site may be a source and/or contributing source to the soil gas,

groundwater, and soil contamination generated by WDI activities. However, the existence of a public health hazard is dependent on the magnitude of contamination in the various environmental media (i.e., soil, water, and air) and not the source.

The following criteria were used to select contaminants for further evaluation: 1) concentrations of contaminants on-site and off-site; 2) quality of the field data, laboratory data and sample design; 3) comparison of on-site and off-site concentrations with environmental comparison values; and 4) community health concerns. Comparison values such as Minimal Risk Levels (MRLs), Environmental Media Evaluation Guides (EMEGs) and Maximum Contaminant Level (MCLs), developed by ATSDR and USEPA are used for air, soil and groundwater. Health comparison values are used to select contaminants for further evaluation and are defined in Appendix A. For worker exposures, CDHS used the threshold limit value of the 8-hour Time Weighted Average (TWA) to assess the health implications of exposure to air in buildings on the WDI Site.

The health comparison values are determined by ATSDR and other agencies to allow for a general screening of contaminants found at sites under investigation. Description of these comparison values can be found in the glossary in Appendix A. These comparison values allow an investigator to quickly sort the contaminants into groups that are either not likely to cause health effects, or contaminants that should be evaluated further. Contaminants that receive further evaluation exist at concentrations that exceed the comparison values and are considered contaminants of concern (COCs).

Toxic Release Inventory (TRI) Search

The Toxic Release Inventory (TRI) maintained by USEPA contains information on estimated annual releases of toxic chemicals from active industrial facilities from 1987 to present. TRI data can be used to get a general idea of the current environmental emissions occurring at or around a site and whether they may be causing an additional environmental burden to the community. TRI contains information on estimated annual releases (emission rates) of toxic chemicals to the environment (via air, water, soil, or underground injection), whether these releases are routine releases, spills and other accidental releases, or occasional releases from normal operation.

CDHS searched the TRI for the years 1987 to present for potential emission from the WDI Site. Facilities must report their releases of toxic chemicals to TRI if they fulfill four criteria: 1) they must be a manufacturing facility; 2) they must have the equivalent of 10 full-time workers; 3) they must either manufacture or process more than 25,000 pounds (lbs) of the chemical or use more than 10,000 lbs during the year; and 4) the chemical must be on the TRI list of 350 specific toxic chemicals or chemical categories (16). CDHS conducted a TRI search for environmental releases from other companies located within the zip code (90670) surrounding the WDIG site. The TRI contained reports of releases of a total of 44 different chemicals from companies located in the vicinity of the WDI Site (Tables 3 and 4). TRI information indicates that in addition to considerable on-site contamination, there are a number of additional sources and releases of contaminants in the vicinity of the WDI Site.

On-Site and Off-Site Contamination

Summary of Soil and Solid Waste Investigations

Soil data was collected during the 1988 Remedial Investigation conducted by USEPA and the 1997 Remedial Design investigations conducted by USEPA and WDIG. These investigations identified buried waste materials in Areas 1, 2 (including the reservoir), 4, 5, 6, 7 and 8. Buried wastes and impacted soils range in thickness from an average of approximately 5 to 10 feet to a maximum of 20 feet (11). From ground surface to approximately eight feet below ground surface (bgs), the reservoir is covered with fill material and a small amount of construction debris, such as concrete, bricks, wood, and asphalt (17). Buried wastes discovered at the site are composed of organic wastes, building debris, drilling muds, industrial sludges/wastes, solvents, refinery wastes, liquids, sludge and oily wastes.

In 1997, USEPA's contractor, CDM Federal Programs Corporation (CDM) and TRC conducted further studies to better define the vertical and lateral extent of the waste materials deposited inside and outside the reservoir and to obtain additional chemical characterization data for the RD investigation (8). Approximately 150 soil borings were drilled by TRC to a maximum depth of 35 feet bgs to determine the depth and extent of WDI buried wastes (Figure 4). TRC collected and analyzed 33 soil samples from soil borings completed outside the reservoir and nine soil borings completed inside the reservoir (8). The chemical contaminants in the waste samples collected in soil borings completed inside the reservoir include: VOCs, such as benzene, TCE, PCE, and cis-1,2-dichloroethene (1,2-DCE); SVOCs, such as 1,2-dichlorobenzene, 2-methylnapthalene, naphthalene, and phenanthrene; and heavy metals, such as arsenic, lead, copper, and chromium (8).

The Preliminary Site Characterization Report for WDI, produced by TRC in March 1998, approximated 148,000 cubic yards of waste material inside the central reservoir on the WDI Site (18). Approximately 211,000 cubic yards of contaminated soils were identified outside the footprint of the WDI reservoir in Areas 1, 2, 4, 5, 7, and 8. The Supplemental Subsurface Investigation produced by TRC in February of 2001 (19) found that a greater volume of contaminated soils existed in Area 1 and Area 8. Some of these contaminated soils exist beneath existing on-site buildings. Investigations have shown 11 of the 19 parcels have structures located over buried waste (11). The total volume of the wastes from Areas 1, 2, 4, 5, 6, 7 and 8 is estimated to be approximately 240,000 cubic yards of waste with an additional 148,000 cubic yards in the reservoir. Therefore, an approximate total of the waste at the site would be 388,000 cubic yards.

Fourteen soil samples were also collected during Preliminary Site Characterization activities (18). Soil samples were collected in December 1997 from soils ranging from 2.4 to 4.8 feet bgs (deeper soil samples were also collected during this effort). Samples were collected from Areas 2, 5, 7 and 8. The majority of the samples were collected over the buried reservoir (Area 2). These samples found occasional detections of VOCs and SVOCs as well as some metals above background concentrations. However, none of these detections were above health comparison values and therefore these detections do not represent a health concern.

In 1999 WDIG completed a shallow waste interim action in a portion of Area 5 where the fill material was less than one foot thick. This approximately 100-square-foot area is located near the Brother's Building in Area 5. Two samples were collected from this area and analyzed for various contaminants. One of the samples was a putty-like material that had some low levels of metals but was non-detect for pesticides, VOCs and SVOCs. The other sample was a drilling mud sample that contained some VOCs, SVOC and metals. With the exception of naphthalene, the concentration of these contaminants was below health comparison values. Naphthalene was detected above the child intermediate EMEG value of 1,000 ppm, but below the adult intermediate EMEG value of 10,000 ppm. Therefore, naphthalene in soil is considered a COC. No pesticides or PCBs were detected in the drilling mud sample.

Summary of the Subsurface Soil Gas Investigations

Although direct exposure to soil gas contaminants is not likely because they are usually buried below the surface, certain buildings may "trap" or "pull" soil gas contaminants inside because of their construction characteristics and operations in the structure. In this manner, soil gas contaminants can enter buildings, and people using the building can inhale the contaminants. CDHS will assess the health risks from soil gas in the indoor air portion of the Toxicological Evaluation Section.

Various studies have been conducted on the WDI Site to assess soil gas conditions and determine the potential to treat soil gas contaminants via Soil Vapor Extraction (SVE) systems. These efforts have identified soil gas contaminants in Areas 1, 2, 4, 5, 6, 7 and 8 of the site. Area 3 has had no soil gas detections. The primary contaminants detected at the soil gas monitoring points are methane, benzene, vinyl chloride, TCE and PCE (11). PCE is the most prevalent VOC detected in soil gas at the WDI Site (11).

There are no comparison values for soil gas. The lack of comparison values for soil gas is, in part, due to the fact that direct exposure to the subsurface gas is unlikely. In place of comparison values, USEPA has determined Interim Threshold Limits (ITLs) for the primary soil gas contaminants detected at the WDI Site (Table 4). The ITLs are tailored to the particular conditions at the WDI Site. Therefore, they should not be applied to other hazardous waste sites without adjusting for the specific characteristics of those sites (20). Concentrations of contaminants in the soil gas detected below the ITLs should pose no threat to human health through the inhalation pathway (9). ITLs for the WDI Site were developed by USEPA using ambient air Preliminary Remediation Goals (PRGs) and conservative risk-based exposure assumptions. In this document CDHS used the ITLs as qualitative screening values for the soil gas concentrations detected at the WDI Site. For a more detailed explanation, please refer to Appendix A.

During the 1989 Remedial Investigation, WDIG's contractor Ebasco collected soil gas samples from 23 vapor wells (VW) installed throughout the WDI Site and analyzed for VOCs and methane (14). Thirty-three different VOCs were detected during the analysis of these samples. Vapor Well #9 (VW-9), located in the center of the reservoir, had the greatest number of contaminants detected (9) and also had the highest concentrations detected. The three highest

concentrations detected in VW-9 were 14,000 parts per billion by volume (ppbv) toluene, 15,000 ppbv benzene and 22,000 ppbv meta & para-xylenes. The highest methane concentrations were detected in VW-25 (Area 7) with 50% methane (9). The most frequently detected VOC in the soil gas samples collected from the vapor wells were TCE and PCE (2).

In 1997, USEPA's contractor, CDM, collected 193 soil gas samples from 80 temporary soil gas probes (GP-series) installed to depths of 3 to 20 feet bgs located within the WDI Site (Figure 5). Soil gas probes were installed to a depth of 10 feet bgs directly adjacent to on-site buildings and along WDI Site borders. Twenty-five chemical contaminants were detected in the temporary soil gas probes (Table 5). The concentrations of vinyl chloride, benzene, chloroform, 1,2-dibromoethane, PCE, xylene, and 1,2-dichloropropane were detected above the ITLs in 11 of the temporary soil gas probes sampled (Table 6) (9). Four of the temporary soil gas probes with concentrations of VOCs exceeding the ITLs are located within 100 feet of on-site buildings (9).

CDM also collected soil gas samples from 25 vapor wells in 1997 (Figure 6). The 25 vapor wells were comprised of 23 of the original vapor wells and two dual probe vapor wells, MP-1 and MP-2, located near 9483 Greenleaf Avenue. The soil gas samples were analyzed for 49 chemical compounds (Table 5). Over 30 chemical contaminants were detected in the vapor wells during both sampling events. Nine chemical contaminants were detected above the ITLs in 10 of the 25 vapor wells sampled (Table 7). Chemicals detected above the ITLs for soil gas include: vinyl chloride, benzene, TCE, chloroform, 1,2-dibromoethane, PCE, carbon tetrachloride, xylene, and 1,2-dichloropropane (9).

Methane was detected above the California Integrated Waste Management Board (CIWMB) standard (5%) in five of the 25 vapor wells. The primary concern with methane is that it can be explosive. The Lower Explosive Limit (LEL) for methane is 5% and the Upper Explosive Limit is 15%. Methane vapor concentrations between 5% and 15% will produce fire or explosion if an ignition source is present. At high concentrations, (33% or greater), methane acts as an asphyxiant by causing oxygen deprivation in humans (21). Four vapor wells sampled in August 1997 had elevated concentrations of methane. All of the remaining 22 vapor wells sampled in August 1997 were below 5% methane.

WDIG's contractor, TRC, collected soil gas samples from the vapor wells on a quarterly basis in 1998 (22). Contaminants detected above the ITLs in vapor wells near buildings on the WDI Site include benzene, cis-1,2-DCE, trans-1,2-dichloroethene, methane, PCE, TCE, toluene, ortho- and para-xylenes, and vinyl chloride (22). TCE and methane have been detected above the ITLs in three vapor wells near the site boundaries (VW-30, 35, and 40). No soil gas contaminants were detected above the ITLs in perimeter vapor wells located on the northeastern boundary of the WDI Site (VW-28, 29 & 42) closest to St. Paul's High School (Figure 4).

SVE studies conducted from 1997 to 1998 at various locations on the site showed overall low levels of methane and VOCs. SVE testing showed that volatile wastes could be removed by vapor extraction and that the mass of soil gas constituents was relatively small (10). Removal of

subsurface gases at the site using SVE has been shown to provide only limited effectiveness due to the relatively low rates of gas generation and the low-conductively character of the soil and fill materials at the site (11).

In July 1998, USEPA's contractor, CDM, installed 10 new vapor wells (VW-54 to VW-63) to monitor for subsurface soil gas contamination in the vicinity of on-site buildings. These wells were screened at three intervals. The first interval (5 to 12 feet bgs) represents the soil interval above the buried wastes. The second interval (13 to 20 feet bgs) represents the average depth of the buried wastes. The third interval (24 to 30 feet bgs) represents the materials below the buried wastes (22). CDM collected and analyzed 29 soil gas samples for VOC and methane. Contaminants detected above the ITLs in the vapor wells include 1,2-dichloropropane, TCE, and vinyl chloride (22).

WDIG's contractor, TRC, collected samples from a total of 59 vapor wells in February, April, August, and November of 1999. Some of the vapor wells were sampled at different depths beneath the soil surface to characterize the vertical extent and composition of soil gases at the site. Of the approximately 550 samples collected there were: 16 methane ITL exceedences, 10 benzene ITL exceedences, 11 vinyl chloride ITL exceedences, 8 TCE ITL exceedences, 2 ITL exceedences for m,p-xylene, o-xylene, toluene, trans-1,2-DCE, PCE and 1,2-dichloropropane. There was one ITL exceedence of cis-1,2-DCE.

In June 2000, TRC released the Annual Soil Gas Monitoring Report for the WDI Site (5). This report consisted of all the soil gas data collected on the WDI Site throughout 1999 and found that elevated concentrations of subsurface gases continue to be observed near the Brother's building in Area 5, near C&E Die Facility in Area 8, as well as the northeast portions of Area 8. Thirty-nine shallow soil gas samples were collected from a depth ranging from 8 to 18 feet below ground surface in 39 wells throughout the site. Six samples from the shallow wells had detections of benzene above the ITL; and two had detections of vinyl chloride above the ITL. Shallow well samples had single ITL exceedences for m,p-xylene, o-xylene, toluene, trans-1,2-DCE, and cis-1,2-DCE. All shallow soil gas samples detected above ITLs were collected from Area 2 or Area 8 (Figure 3). The detections in shallow soil gas in Area 8 are of some concern because of existing site buildings and operations in this area.

Investigations have revealed that there are large variations in subsurface gas concentrations across the site area (11). No soil gas contaminants have been detected in Area 3. Soil gas concentrations are generally lowest in Areas 4 and 6. Area 1 has low to moderate soil gas contamination and has some buildings with active businesses. Area 7 has some high levels of soil gas, but has no buildings on it. Area 5 and 8 appear to be of greatest health concern because there are several buildings with active businesses in these areas where workers could inhale soil gas contamination that migrates into the buildings (Figure 3). Although soil gases directly over the reservoir are generally of the highest concentrations, there is only one building in Area 2 and it is not over the reservoir. Therefore, soil gases in Area 2 are generally of less concern for human health risk than Areas 5 and 8. Continued soil gas monitoring and a soil gas collection and treatment system in the reservoir comprise a part of the selected final remedy for the site.

Summary of the Liquid Investigations Conducted at the Reservoir

During the summer of 1998, USEPA Environmental Response Team (USEPA-ERT) and WDIG's contractor, TRC conducted hydrogeologic pumping tests and dug test pits and trenches to characterize the liquids in the reservoir area. The primary purpose of this investigation was to determine whether the liquids within the reservoir were infiltrated rainwater or previously disposed liquid wastes. The investigations resulted from the presence of liquids in a vapor well located near the center of the reservoir (5). In order to evaluate the feasibility of removing liquids from the reservoir, TRC installed two extraction wells (EX-1 and EX-2) and several monitoring probes. Liquids of various composition (e.g., water and oily-waste liquids) and volume were detected at several different depths in the monitoring probes and in one of the extraction wells. Based on the data obtained from the investigations, the occurrence of liquids in the reservoir is inconsistent.

During July 1998, USEPA-ERT and USEPA's contractor, CDM, conducted a more thorough investigation to determine the location and type of materials within the reservoir (5, 23). CDM installed probes in a 50-foot space grid pattern over the reservoir. From zero to five feet bgs, the reservoir area contained fill material and construction debris, such as concrete, bricks, wood, and asphalt. From 5 feet to 10 feet bgs, the reservoir contained a mixture of fill material and clay/sludge. From 10 to 23 feet bgs, the reservoir contained a grey to dark grey, oily clay/sludge or gravelly clay/sludge (5). Based on the results of the investigation, there is no consistent pattern in the type and distribution of wastes and liquids throughout the reservoir area (5). There were locations with little or no liquids, locations with water only, locations with oily-liquids above water, and locations with oil only (5).

In an effort to assess the feasibility of removing liquids from the reservoir, WDIG's contractor, TRC installed eighteen liquid extraction wells. The extraction wells are connected to piping that carry the liquids to an oil and water separator unit. The oily liquid is separated from the liquid and placed in a small oil storage container and sampled for hazardous substances (17). The separated water is treated in an activated carbon unit before it is stored in a 20,000-gallon tank (17). Extracted and treated reservoir water is temporarily stored in the storage tank and periodically picked up for off-site disposal (17). Both the water and oily liquids are analyzed for hazardous substances prior to off-site disposal at a USEPA-approved treatment and disposal facility (17). As of 1999, over 39,000 gallons of liquid and 140 gallons of oil have been recovered (17). Although liquid extraction systems appear to be technically feasible, they are cost-prohibitive due to the very low extraction rates (11).

Summary of Background (Outdoor) Air Monitoring Investigations Conducted at WDI

During August and September 1997, USEPA's contractor, CDM collected background (outdoor) air samples for each weekend that in-building air samples were collected. The 24-hour background air samples were collected in the southern corner of the WDI Site at the junction of Greenleaf Avenue and Los Nietos Road (IBM-49). This location was reportedly chosen as the background data collection point because strong odors were observed in the area (Personal communication with Mr. Roberto Puga of Project Navigator, Ltd). The VOCs detected in the

background air samples include: toluene, xylene, benzene, 1,2,4-trimethylbenzene, 1,3-dichlorobenzene, chloromethane and 1,2-dichlorobenzene (9). Seven other VOCs (dichlorofluoromethane, trichlorofluoromethane, methylene chloride, 1,1,1-trichloroethane [1,1,1-TCA], PCE, ethylbenzene, and 1,4-dichlorobenzene) were detected in the background air samples at WDI at concentrations of less than 1.0 ppbv (9). CDHS compared concentrations at WDI to data collected by the California Air Resources Board from Burbank, North Long Beach and North Main Street in Los Angeles (24). The concentrations of VOCs detected from IBM-49 (Figure 6) are comparable to VOC air concentrations reported for the above-mentioned Los Angeles County locations.

CDHS considers background sampling location IBM-49 to be less than ideal because it's located at the junction of Greenleaf Avenue and Los Nietos Road, where there is considerable automobile traffic. It is likely that some of the samples were impacted by automobile exhaust. This sample location is also several hundred feet from the St. Paul's School and residences near the WDI Site.

In August 1999 WDIG's contractor, TRC, collected ambient air data from IBM-24, 26, 49, 51 and IBMTM-13 as part of the annual soil gas monitoring report (Figure 6). Ambient air data collected from these locations add valuable information to our understanding of ambient air at the site and immediate vicinity. Ambient air data collected at IBM-26 and IBM-51 are particularly useful because they are close to the residential neighborhood and the St. Paul's School. These areas are preferable as reference locations for health reasons because they are closer to where residents, school children and staff could be exposed to potential gas contamination that could be released from the WDI Site. The ambient air data collected from IBM-24, 26, 51 and IBMTM-13 are comparable to data collected in 1997 at IBM-49, but generally have lower values for contaminants related to automobile exhaust, such as benzene and toluene. Because these sample locations more closely represent air in the nearby residential neighborhood and the St. Paul's School, CDHS has recommended that ambient air samples be collected from IBM-51 when ambient air sampling occurs in the future.

In-Building Air Samples

During August and September 1997, USEPA's contractor, CDM, collected 44 in-building air samples from the 25 buildings located on the WDI Site (Figure 7). As a "worst case" analysis of the buildings, the 24-hour air samples were collected over the weekend when the businesses were more likely to be closed and there is less ventilation from the outside air (2). Air samples were collected from all site buildings, but not every tenant space.

More than 25 VOCs were detected above the background concentrations in the in-building air samples (9). The following chemicals were detected above the in-building air ITLs: 1) methane, an explosive gas that is generated through the decomposition of organic matter in wastes at the site; 2) benzene, a characteristic component of petroleum wastes and a known human carcinogen; 3) toluene, a typical component of petroleum wastes; 4) TCE, a common industrial

solvent frequently observed in soil gas samples; 5) PCE, also a common industrial solvent found in groundwater beneath the site; and 6) vinyl chloride, a degradation product of TCE and PCE and a known human carcinogen (9).

In addition, CDM conducted site inspections of the buildings to determine whether any of the VOCs detected within the buildings were related to the chemical products currently being used by the on-site businesses (Table 8). CDM determined that the businesses located on the WDI Site use a wide variety of petroleum products and solvents in their daily operations. The use of these chemicals could cause or elevate concentrations of VOCs in ambient air in the site buildings.

Based on available indoor air monitoring data it is uncertain whether contaminated soil gas is migrating into on-site buildings. This uncertainty is primarily the result of the use of chemicals within the buildings for commercial or industrial purposes. Therefore, it is not currently possible to discern how much, if any, of the soil gas in the vicinity of the buildings are getting into site buildings. In addition, on-site buildings have had detections of contaminants found in ambient (background) air samples.

Another variable that contributes to the uncertainty of the soil gas migration question is that in some buildings indoor air concentrations of chemicals of concern (e.g., benzene) are greater than the concentrations detected in soil gas. It is also unclear whether operations in one space within site buildings could impact the air in adjoining or adjacent operations because many of the tenants are very close to one another.

From February through April 1999, WDIG's contractor, TRC, performed additional air monitoring within seven on-site businesses located adjacent to buried wastes, particularly near areas where elevated concentrations of VOCs and methane were confirmed in the soil gas (2). The seven businesses include: Brothers Machine (Area 5), E & L Electrics (Area 1), R & R Sprouts (Area 8), Stansel Brothers (Area 8), Buffalo Bullets (Area 8), C&E Die Fabrications (Area 2), and H & H Contractors (Area 8) [2]. The location of these businesses can be seen in Figures 6 and 7. In their 1999 Subsurface Gas Contingency Report (9), CDM concluded that VOCs detected during monitoring may be due to onsite business chemical usage.

In July 2000, TRC released the Annual In-Business Air Monitoring Report for the WDI Site (25). This report consists of in-business air data collected on the WDI Site in February, April, August and November of 1999. Indoor air samples were collected and analyzed for methane and VOCs from businesses in areas 1, 2, 5, and 8 (Figure 3). Seven businesses were sampled in 1999 with a total of 23 indoor air samples collected and analyzed.

Area 1 In-building Air Samples

R&R Sprouts was sampled in February, April, and August 1999. In February 1999 benzene was detected at 2.0 ppb. In April 1999, chloroform was detected at 10.0 ppb. TRC concluded that benzene levels in Area 1 are likely due to on-site activities, such as the truck facility located next

door (26). Chloroform detections could be from the use of cleaning agents (e.g., chlorine bleach) in R&R Sprouts cleaning process. Concentrations of VOCs detected in buildings in Area 1 are all below their respective 8-hour Time Weighted Averages (TWA).

Area 2 In-building Air Samples

C&E Die was sampled in February, April, August, and November 1999. Benzene was detected at 2.4 ppb in February. Acetone was detected at 880 ppb in November. It is possible that the benzene detected could be the result of on-site activities. C & E Die use a variety of machine oils and solvents in their processes (Table 8). Concentrations of VOCs detected in buildings in Area 2 are all below their respective 8-hour TWAs.

Area 5 In-building Air Samples

Brothers Machine Shop was sampled in February, April, August, and November 1999. Benzene concentrations in February (2.1 ppb) and August (16 ppb) were slightly above the intermediate EMEG (4 ppb), but well below the TWA (10,000 ppb). Brothers Machine Shop uses hydraulic oils, diesel fuel, and spray lubricants in their operations (Table 8). Concentrations of VOCs detected in buildings in Area 5 are all below their respective 8-hour TWAs.

Area 8 In-building Air Samples

Stansel Brothers was sampled in February, and April 1999. Benzene was detected in February (6.6 ppb) and April (6.4 ppb). Acetone was detected in February (750 ppb) and April (640 ppb). Stansel Brothers use acetone, cutting oils, aerosol cleaners, lubricating oils, and kerosene in their operations (Table 8).

Buffalo Bullet was sampled in February, April, August and November 1999. Benzene was detected in February (2.4 ppb). Site visits to this property identified kerosene, naphtha and degreasing solvents as chemicals likely utilized in site operations.

Durango Designs was sampled in April and November 1999. TCE was detected in April and November (12 & 42 ppb). Chemicals identified on-site at Durango Designs include paint thinner, acetone, and methylene chloride (Table 8).

Indoor air at H&H Contractors was sampled in February, April, August and November 1999. Benzene was detected in all four of these samples (3.9, 3.2, 2.6, and 2.4 ppb respectively). PCE was detected in February (22 ppb). Acetone was detected in April, August, and November (340, 490, and 430 ppb respectively). Various cans of glue, varnish, shellac, gasoline, and paint thinner were observed in this property during air monitoring efforts (Table 8).

A variety of chemicals are used in businesses on the WDI Site that could release volatile compounds that would then potentially be detected in indoor air sampling. Paints, paint thinners and cleaning solvents are the most common agents used in the businesses on-site. Although formulations vary from one product to another, most paints, thinners and solvents contain some

volatile compounds such as benzene, toluene, ethyl benzene and xylene. At least one business uses Super 77 Spray Adhesive, which contains hexane and other hydrocarbons. Several businesses use WD-40, which contains petroleum distillates. Petroleum distillates are composed of a mixture of aromatic (ring-shaped with double bonds) and aliphatic (open chain) hydrocarbons (chemicals made of carbon and hydrogen). The aromatic hydrocarbons, such as benzene, toluene and xylene, tend to be the more toxic compounds found in petroleum distillates. Benzene, toluene and xylene have been detected in several indoor air samples at the site. Under current conditions the concentrations of VOCs detected in buildings on the WDI Site do not appear to pose an occupational health risk as all the VOCs detected are well below their respective 8-hour TWAs. However, some VOCs are above EMEG values suggesting that if these buildings were to be used for non-worker purposes, a more thorough assessment would need to be conducted.

Summary of the Groundwater Investigations

Groundwater has been encountered at depths of 48 to 65 feet bgs at the site (11). Groundwater appears to flow southeast on the southeastern portion of the site and radially southwest on the southwestern portion of the site. (11) The horizontal groundwater gradients are very low across the site ranging from 0.002 feet/foot in the western portion of the site to 0.003 feet/foot in the eastern portion of the site (11).

During the 1988 RI, WDIG's contractor, Ebasco, installed 27 groundwater monitoring wells. These wells were sampled nine times between 1988 and 1998. The wells were sampled in February, May, and August 1992; June and September 1995; September 1997; and January, November, and April 1998. The groundwater was sampled for VOCs, SVOCs, PCBs, pesticides, and metals (8). The most common VOCs detected in the groundwater samples taken at the WDI Site were TCE, PCE, cis-1,2-DCE, and toluene (5). Other VOCs detected in the groundwater include methylene chloride, 1,2-dichloroethane (1,2-DCA), 2-hexanone, chloroform, 1,2-DCE, 2-butanone, and xylene (8). There were no detections of SVOCs, pesticides, or PCB compounds in the groundwater at the WDI Site (8).

The highest concentrations detected during the 2000 groundwater monitoring effort were above comparison values. The maximum concentration of PCE (110 ppb) collected from GW-11 was above the MCL (5 ppb) and the child RMEG (100 ppb). The maximum concentration of TCE (17 ppb) was above the MCL of 5 ppb. The maximum detection of selenium (56 ppb) is above the MCL (50 ppb) and the child RMEG (50 ppb). The maximum detection of thallium (56 ppb)is above the MCL (2 ppb). Based on the maximum concentrations detected in groundwater samples collected in 2000 selenium, thallium, PCE and TCE are considered COCs because they are above their respective health comparison values. Although groundwater beneath WDI has had detections above health comparison values, it does not appear that anyone is being exposed to these waters currently.

Several VOCs and metals have been detected above their respective MCLs in groundwater samples from the site. However, based on their distribution in groundwater, these accedences do not appear to be related to site wastes (10) The sources of PCE and TCE detected in the western

portion of the site appear to be from solvent releases associated with upgradient industrial sites (10). There are a number of industrial and commercial operations in the vicinity of the WDI Site. There is one NPL site in the area in addition to the WDI Site. The Omega Chemical Site is located approximately 1.3 miles northeast of the WDI Site and has documented VOC groundwater contamination. There are an additional 24 properties within approximately 1 mile of the WDI Site that are known chemical release sites.

Based on prevailing groundwater flow direction (southerly), there are several known chemical release sites which are likely upgradient of the WDI Site, including:

- The Associated Plating Company, located approximately 0.2 miles northwest of the site, had a 14,500-pound release of PCE;
- A leaking tank was reported at Rifkin Realty, located approximately 0.4 miles north of the site. The tank was leaking an unknown material;
- A leaking tank was reported at Salz Leather, located approximately 0.4 miles north of the site. The tank was leaking an unknown material;
- A 1,500-pound release of xylene reported at PFI, Inc., 0.2 miles north of the site;
- A leaking solvent tank was reported at Peterson/Puritan, Inc., located approximately 0.5 miles northwest of the site;
- A leaking tank was reported at McKesson Chemical Corporation, located approximately 0.6 miles northwest of the site. The tank was leaking an unknown material;
- A leaking underground storage tank of VOCs was reported at Calavar Corporation, located approximately 0.5 miles northwest of the site; and
- An unknown vehicle released an unknown chemical at 8922 South Nogal Street, located approximately 0.8 miles north of the WDI Site.

CDM Federal, on behalf of EPA, concluded in their Groundwater Data Evaluation Report (8) that significant impact on groundwater has not been identified from the site based on available sampling results and the location and characteristics of the waste sources (10). No wells in the vicinity produce water form the shallow groundwater zone that underlies the WDI Site (11).

Limitations With the Investigations Described in this Public Health Assessment

Limitations in the scope of an investigation and/or lack of sufficient data can be a source of uncertainty associated with any scientific investigation. It is the view of the authors of this document that the limitations and data gaps do not compromise the conclusions of this PHA. However, a variety of uncertainties must be taken into account when considering the strength of the conclusions and the recommendations made. The recommendations presented in this document are aimed at addressing the limitations described below.

Limitation of the In-Building Air Sampling Results

There are a number of potential sources for air contaminants found inside buildings. In addition to soil gas, indoor air contaminant sources may include the chemicals contained in the ambient (background) air and the chemicals released into the building from the building components and

contents. Furthermore, if a building houses operations that utilize chemicals (e.g., solvents, cleaning solutions, etc.) in their operations, those chemicals can contribute significantly to the concentrations of contaminants in the in-building air.

The presence of benzene, toluene, and xylene in on-site building air may be due to the use of petroleum products such as gasoline or motor oil used by many of the automobile repair businesses located on the WDI Site. Additional sources of benzene, toluene and xylene include automobile traffic near the site and any automobile traffic on site. The presence of TCE, PCE, and vinyl chloride may be due to the use of solvents by the on-site businesses (9).

Based on the contaminants detected and the number of potential sources of contamination, it is difficult to determine the sources of indoor air contaminants at WDI. Current chemical use at the site in conjunction with the concentrations of contaminants detected in site buildings suggest that chemical use in site buildings has a significant impact on indoor air at the WDI Site. However, subsurface soil gas contaminant migration into on-site buildings can not be ruled out as a contributor to indoor air contamination because contaminants detected in the soil gas have also been detected in some on-site buildings and in ambient (background) air samples on site.

Pathways Analyses

This section addresses the pathways by which people on or near the site may have been exposed to hazardous materials in the past, are being exposed currently, or may be exposed in the future.

When a chemical is released into the environment, the release does not always lead to exposure. Exposure only occurs when a chemical comes into contact with people and enters the body. For a chemical to pose a human health risk, a complete exposure pathway must exist. A complete exposure pathway consists of five elements: 1) a source and mechanism of chemical release to the environment; 2) a contaminated environmental medium (air, soil, or water); 3) a point where someone contacts the contaminated medium (known as the exposure point); 4) an exposure route, such as inhalation, dermal absorption, or ingestion; and 5) the person or people exposed. Exposure pathways are classified as either completed, potential, or eliminated. In completed exposure pathways, all five elements exist. Potential exposure pathways are either: 1) not currently complete, but could become complete in the future, or 2) are indeterminate due to lack of information. Pathways are eliminated from further assessment if one or more elements are missing and are never likely to exist.

A time frame given for each pathway indicates whether the exposure occurred in the past, is occurring now, or is likely to occur in the future. For example, a completed pathway with only a past time frame indicates that exposure did occur in the past, but exposure is not occurring now and is not likely to occur in the future. The health implications of the completed exposure pathways are discussed in the Public Health Implications section. See Table 9 for additional information pertaining to exposure pathways.

For this PHA, the shallow soil gas data is of great importance because soil gas exposure is the pathway that is most likely to be completed because the majority of the contamination on the site

is not mobile and is buried with five to 15 feet of fill material. Current conditions do not appear to be impacting groundwater significantly. However, gases continue to escape from the reservoir and other buried waste areas (Figure 4). Because gas is mobile, soil gas contamination could migrate into buildings on the WDI Site.

Completed Exposure Pathways

Past and Present Exposure of On-Site Workers to Contaminants in Indoor Air from Soil Gas

Several buildings on the site are very close to or directly over contaminated soil and buried wastes on the WDI Site. VOCs in the soil and groundwater can move through the soil into buildings affecting the quality of indoor air. The concentrations of VOCs detected in buildings on the site are at levels well below occupational threshold values. However, levels of VOCs detected suggest that if the site buildings were to be used for residential purposes in the future, a potential health risk could exist and additional indoor air sampling would be necessary. Because there are operations in these buildings that use chemicals, it would be inappropriate to assess the health risks to people that might live on the site in the future using current air data.

USEPA has conducted in-building air samples at businesses located on the WDI Site and detected several VOCs. The source of these VOCs is not clear. Possible sources include the use of chemicals inside buildings during business operations and soil gas vapor migration from the WDI wastes getting into the buildings via soil gas migration pathways. There is also the possibility that some of the contaminants detected are from other products in the buildings such as furniture or carpeting or from background air contaminants such as automobile exhaust.

An inventory of chemicals used in the buildings on the site has determined that all but one of the businesses located on the WDI Site use petroleum-based chemicals. Operations on the site include autobody shops, machine shops, printing shops and a variety of light industrial and commercial businesses. These businesses use a variety of chemicals in their operations (Table 8), many of which have some volatile component.

Because indoor air sampling can not clearly identify the source of the chemicals getting into the buildings, CDHS used modeling to estimate the possible impacts on indoor air from the soil gas contaminants coming from the wastes on the site. Soil gas modeling indicates that chemicals coming from the wastes on the site could contribute to levels of VOCs detected in the air within buildings, but are not the only contributor to indoor air VOC concentrations.

Irregardless of source, the concentrations of VOCs detected in air in the buildings on-site do not pose an occupational health concern. Therefore, this pathway is considered a completed exposure pathway in the past and presently for on-site workers, but does not pose a health concern.

Potentially Completed Exposure Pathways

Potential Future Exposure to Groundwater Contaminated With VOCs - Workers and Residents in the City of Santa Fe Springs

Based on the groundwater monitoring investigations conducted since 1988, VOCs and metals have been detected in groundwater samples collected from the monitoring wells installed at WDI and upgradient of the site. These contaminants may have originated from another Superfund site, Omega Chemical. The Omega Chemical Site is located northeast of the WDI Site in the City of Whittier (27). Contaminated groundwater is migrating off the Omega Site in a southwest direction towards the City of Santa Fe Springs and the WDI Site. Currently, this contamination is not impacting the nearest operating downgradient municipal groundwater well, DWR #02/11W-30R3S, which belongs to and serves the City of Santa Fe Springs. This municipal water supply well is located approximately one mile northwest of the WDI Site. Therefore, no exposure to these groundwater contaminants occurred in the past or is occurring now. USEPA is working to contain this plume and remediate the groundwater to prevent the contaminated groundwater plume from impacting this municipal well.

The contaminants in the groundwater do not appear to be related to the WDI Site because contaminants have been detected upgradient or cross gradient to the WDI waste sources (8). However, because of groundwater contamination problems in the area, CDHS considers this a pathway that could be completed in the future if municipal wells are contaminated and corrective actions are not taken (Table 10). This is not a likely scenario, but is considered a possibility.

Potential Future Exposure of On-Site Workers to Contaminants in Indoor Air from Soil Gas

Because this pathway is currently considered completed (see above) and the source of the soil gas (buried wastes) are not being completely removed, the possibility exists that soil gas contaminants will continue to make their way into buildings on the WDI Site. However, it is unlikely that the levels of VOCs getting into the buildings via soil gas will present a worker health risk. If, for some reason, these buildings were to be used for other purposes such as residential dwellings, additional data would need to be collected an a more thorough assessment of the health risks would be warranted.

Any future development activities that require excavation or grading on the WDI Site could expose subsurface contamination and potentially release soil gases into the working environment. Therefore, there is potential for future exposure to soil gas contamination if excavation activities occur at the WDI Site without engineering controls.

Potential Future Exposure to Contaminated Soils and Wastes - Workers on the WDI Site, St. Paul's School Staff & Students and Residents in the Vicinity of the WDI Site

Based on investigations conducted at the WDI Site, the waste materials at the site are generally composed of oily wastes and solvents that contain varying concentrations of VOCs, SVOCs and metals. Although the wastes inside the buried concrete reservoir and in the waste

containment/sump areas outside the reservoir are highly contaminated, there is currently no exposure to the waste in the majority of the site because it is covered with five to 15 feet of clean fill material.

The only exception to this is in Area 5 of the site near the Brother's building, where fill materials are less than one foot thick in a 100-square-foot section. Samples collected in this area consisted of a putty material and drilling muds. The putty material appears to be non-hazardous. The drilling muds contain some petroleum contaminants. The most significant detection in the drilling mud was a detection of 3,700 ppm of naphthalene. Other PAHs detected included 8,500 ppm 2-methyl naphthalene and 2,100 ppm phenanthrene. Neither 2-methyl naphthalene or phenanthrene have health comparison values. Naphthalene was detected above the child intermediate EMEG value of 1,000 ppm, but below the adult intermediate EMEG value of 10,000 ppm. Because this area is currently paved, exposure to soils in Area 5 near the Brother's building is not considered complete. However, if the pavement in this area were removed in the future and children were exposed to these soils, potential adverse health effects could occur.

Although there is no current exposure to wastes at the WDI Site, future activities such as excavations and subsurface utility work could disturb waste areas that are currently buried and would then present a potential health risk to people in the area. Although this is not a likely event, it can not be ruled out entirely and is therefore considered a potentially completed exposure pathway.

Pre-1966 Exposure to Contaminated Wastes-Workers on the WDI Site, St. Paul's School Staff & Students and Residents in the Vicinity of the WDI Site

Currently wastes at WDI are not considered to be likely to be an exposure risk. However, prior to 1966, when the site was filled and graded with five to 15 feet of fill material, there was a potential exposure risk to contaminants at WDI. It is not currently possible to assess the degree to which this exposure could have been a health risk because there is no known environmental data from the site from this time period and it is not clear what all the uses were for the site. For example, some residents reported that they had been on the site prior to the site being filled and graded. If so, they may have been exposed to the oil wastes and other contaminants disposed of on the WDI Site.

Eliminated Exposure Pathways

Past, Present and Future Exposure to Surface Soils - Workers, St. Paul's School Staff and Students and Residents in the Vicinity of the WDI Site

Based on soil investigations conducted at the WDI Site in 1997, exposure to workers and residents to current surface soils do not appear to present a health risk. Although soils analyzed in the area do have occasional detections of VOCs, SVOCs and metals above background levels, they are not considered to be a health concern because none of the contaminants detected were above their respective health comparison values. Therefore, this pathway is eliminated from further consideration (Table 11).

Past, Present and Future Soil Gas Exposure to Residents in the Vicinity of the WDI Site and St. Paul's School Staff and Students

Soil gas investigations conducted at the site show elevated concentrations of methane and other soil gas contaminants within the buried reservoir and in sump areas outside the reservoir (2). Because soil gas follows the path of least resistance, vertical migration towards the soil surface is far more likely than horizontal migration. Horizontal migration of soil gases usually occurs when the gases are associated with a contaminant plume (which is not the case at WDI) or have a conduit through which to travel. Currently, there are no known subsurface conduits (such as a tunnel or pipeline) which travel from WDI towards the St. Paul's School or the nearby neighborhood to the east. Therefore, migration of soil gases from the WDI Site towards the St. Paul's School and the neighborhood across Greenleaf Avenue is highly unlikely and this pathway is eliminated from further consideration.

Past and Present Exposure to Contaminated Drinking Water - On-Site Workers, St. Paul's School Staff & Students and Residents

No known private drinking water wells are currently in use on the WDI Site or in the immediate vicinity. There are no known historical water supply wells on the WDI Site. The closest known water supply well is approximately one mile from the WDI Site. CDHS confirmed that there were no site-related contaminants detected in the Santa Fe Springs municipal water wells (discussion with Abbas Amir, Associate Sanitary Engineer with the CDHS-Drinking Water and Environmental Health Division, Field Operation Branch-Metropolitan District. September 24, 1999). The June 2002 Amended Record of Decision found that there are no wells in the vicinity that produce water from the shallow groundwater zone that underlies the WDI Site (11). Based on this information, the past and present exposure to contaminated drinking water is considered eliminated.

Current Exposure to Contaminated Wastes on the WDI Site - On-Site Workers, St. Paul's School Staff & Students and Residents in the Vicinity of the WDI Site

Because wastes at the WDI Site are currently buried in five to 15 feet of fill (with the exception of the small portion of Area 5) and the fact that much of the site is paved, there is no access to wastes at the site. Based on current usage of the site it appears unlikely that people are exposed to these wastes and thus they do not represent a health risk and are eliminated from further consideration.

Children's Health Considerations

ATSDR recognizes that infants and children may be more sensitive than adults to environmental exposures. This sensitivity is a result of several factors: 1) Children may have greater exposures to environmental toxins than adults because pound for pound of body weight, children drink more water, eat more food, and breathe more air than adults; 2) Children play outdoors close to the ground which increases their exposure to toxins in dust, soil, surface water, and in the ambient air; 3) Children have a tendency to put their hands in their mouths while playing,

thereby exposing them to potentially contaminated soil particles at higher rates than adults (also, some children ingest non-food items such as soil which is a behavior known as "pica"); 4) Children are shorter than adults, which means they can breathe dust, soil, and any vapors close to the ground; 5) Because children grow and develop rapidly, they can sustain permanent damage if toxic exposures occur during critical growth stages; and 6) Children and teenagers may disregard "No Trespassing" signs and wander onto restricted locations. Because children depend on adults for risk identification and management decisions, CDHS is committed to evaluating their special interests at hazardous waste sites as part of the Children's Health Considerations.

CDHS has attempted to identify places (e.g., parks, schools, recreational facilities, etc.) in the vicinity of the WDI Site where children live, play, and/or go to school. The closest location where children may spend time is at St. Paul's High School adjacent to the WDI Site and the residential neighborhood to the east of the site. For the reasons described previously neither the groundwater nor the waste material in the reservoir and adjacent to the reservoir represent a public health hazard for children. Based on the soil gas data, there were no contaminants detected above the site boundary interim threshold levels in the perimeter vapor wells located on the boundary of the WDI Site facing St Paul's High School and the nearby neighborhood. It does not appear likely that soil gas from the WDI Site will migrate towards St Paul's High School or the nearby neighborhood.

Public Health Implications

Toxicological Evaluation

In evaluating health effects, several factors determine whether harmful effects will occur and the type and severity of those health effects. These factors include: the dose (how much); the duration (how long); the route by which people are exposed (breathing, eating, drinking, or skin contact); other contaminants to which they may be exposed; and their individual characteristics such as age, sex, nutrition, family traits, life style, and state of health.

In order to determine whether adverse health effects are possible as a result of exposure to a contaminant, an exposure dose must be estimated for each pathway. This exposure dose can then be compared with appropriate toxicity values in order to evaluate the likelihood of adverse health effects occurring. Toxicity values used to evaluate non-cancer adverse health effects include ATSDR's Minimal Risk Level (MRL) and EPA's Reference Dose (RfD) for ingestion and Reference Concentration (RfC) for inhalation. The MRL, and RfD values are estimates of daily human exposure to a contaminant below which non-cancer, adverse health effects are unlikely to occur. See Appendix A for additional information about health comparison values.

The National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), and USEPA have reviewed available information from human and/or animal studies to determine whether certain chemicals are likely to cause cancer in humans. USEPA has developed cancer slope factor values for many carcinogens. A cancer slope factor is an estimate of a chemical's potential for causing cancer.

Data reviewed for this PHA indicate that soil gas, contaminated soils and buried wastes on the site pose a potential health concern. The only completed exposure pathway is from soil gas migration to indoor air in the buildings located on the WDI Site. However, this completed exposure does not appear to pose any health risk to workers on the site. In this section CDHS has included an analysis of the potential health impact, both non-cancerous and cancerous, to on-site and off-site workers and nearby residents for drinking water, soil gas and soil pathways.

Off-site Workers and Residents in the Vicinity of the WDI Site-Potential Exposure to Contaminants in the Groundwater

CDHS has reviewed the 2002 Water Quality Report for Sante Fe Springs (28) and concludes that there were no contaminants detected in the municipal water drinking system above their respective MCLs. There is no known past or current exposure to contaminants from WDI in the drinking water from municipal wells. The City of Santa Fe Springs municipal wells are sampled on a regular basis to insure that the quality of the water meets California drinking water standards (discussion with Abbas Amir, Associate Sanitary Engineer with the CDHS-Drinking Water and Environmental Health Division, Field Operation Branch-Metropolitan District. September 24, 1999).

To conservatively estimate cancerous and non-cancerous health risks, CDHS calculated the potential impact groundwater contaminants would have if they impacted municipal well DWR #02/11W-30R3S and this well were used for potable water after it was contaminated. CDHS assumed that a person ingested two liters per day of the contaminated groundwater for 30 years. This is being evaluated as a possible potential future scenario that could only occur if remedial action relative to the contaminated groundwater fails to protect the drinking water supply from contamination and such contaminated water were then passed on to consumers. This is a very conservative estimation of the toxicological evaluation for this potential future exposure pathway because as the contaminated groundwater plume moves, the plume will become more spread out resulting in dilution of the contaminant concentrations. Additionally, there would likely be some chemical breakdown of the chemicals in the groundwater, further lowering the concentrations of contaminants that could reach the municipal groundwater well. Finally, if contaminated groundwater were to reach the municipal well it would likely be closed and taken out of use.

Using groundwater data presented in TRCs 2000 Annual Monitoring Report (29), CDHS estimated cancer and non-cancer health risks from consumption of the maximum concentrations of COCs detected on the WDI Site. The COCs identified include three metals (manganese, selenium and thallium) and two chlorinated solvents (PCE and TCE). Maximum concentrations detected exceed MRLs and RfDs for all five of the COCs. Thallium and TCE had maximum detections that could cause some non-cancer health effects. Maximum concentrations of PCE and TCE would be expected to increase cancer risks.

Non-cancer health effects that could occur from exposure to COCs include: kidney damage from PCE exposure (30); neurological problems from exposure to manganese and thallium (31, 32); skin irritations from exposure to selenium, PCE and TCE (30, 33, 34); liver damage from

exposure to thallium, PCE & TCE (30, 32, 34); dizziness, confusion and headaches from exposure to PCE & TCE (30, 34); and liver damage from exposure to thallium and PCE (30, 32).

CDHS estimated the total increased lifetime excess cancer risk from drinking water contaminated with PCE and TCE. CDHS estimates that this exposure would result in three to four additional cancer cases in a population of 10,000 people (3.43 x 10-4 risk). These increases are considered to be a low increased cancer risk. This low increased cancer risk would be predicted if the contaminants in the groundwater impacted the municipal well at current concentrations and no interventions were taken. This is a very unlikely scenario.

Health Outcome Data Evaluation

In response to a concern voiced by a community member, the CDHS-CSS and USC-CSP reviewed the incidence of invasive cancer for the Los Angeles County census tract 5029.02. This census tract encompasses the area bounded by: Painter Avenue and Carmenita Road on the east; Lakeland Road on the south; the railroad track and Santa Fe Springs Road on the west; and the railroad track and Mulberry Drive on the north. This area includes the neighborhood (near Greenleaf Avenue and Los Nietos Road) where the concerned community member lives (35). CDHS has reviewed this review and summarizes it below.

The cancer review was based on the California Health and Safety Code, the California Cancer Registry, with assistance from eight regional registries, on every case of cancer diagnosed in a California resident after January 1, 1988. This review covered the period from 1988 to 1994. Information on later years was not available at the time of analysis because it takes a while for the registry list to completely reflect the more recently diagnosed cancers, due to a lag time in reporting and necessary quality control measures. The registry calculates the number of cancers that would be expected to have occurred among residents of the census tract, if these residents had the same cancer rates as other residents in Los Angeles overall. Then, the numbers of cancer cases that have actually been diagnosed in that census tract are reviewed. The assessment is based on comparing the observed number of cancers (the actual) with the expected number estimates. The estimates take into account the age, sex, and race/ethnicity of the specific census tract, because this would affect how many cases of cancer are to be expected. Because of natural variability, the actual number of individual cancers that appear in a particular census tract is unlikely to match exactly the specific expected number that is estimated based on Los Angeles County rates overall. It would thus be expected that the number of actual, observed cancers is by chance somewhat higher or lower that the estimate of expected cancers, but still falls within an expected range.

The assessment can also include reviewing the distribution of the types of cancers found to see if specific types of cancers are occurring in particular neighborhoods. This effort can also help to determine if cancer rates in specific neighborhoods are similar to the types and frequencies of cancers found in Los Angeles County overall. Lastly, the ages of the patients at the time of their diagnoses can be reviewed, to see if cancers are occurring at earlier ages than would be expected.

For the residents of census tract 5029.02, the estimated number of all invasive cancers was 7.3 per year, or 51 for the seven-year period studied. Review of the data from 1988 to 1994 shows that 54 cases of invasive cancer of all anatomic sites were diagnosed during this time. These findings are well within the limits of natural variability for such numbers. Cancers of the breast, lung, urinary system, brain, and leukemia were examined separately as well, and none were elevated over the expected number. The distribution of the types of cancers diagnosed was not unusual, and the ages of patients at the time of their diagnosis were not younger than average.

Furthermore, CDHS-CSS reviewed all the cancers that were diagnosed in persons who lived on specific streets in the neighborhood where residents had noted that a number of cancers had occurred, an area bounded by Greenleaf Avenue, Barton Road, Painter Avenue, and Mulberry Drive. The review found many different types of cancers. Neither the specific cancer types that were diagnosed, nor the ages at which diagnoses occurred, were different from what would be expected compared to California as a whole. Unfortunately, it is rarely possible to determine the specific cause of cancer in an individual. Information from studies among groups of people with cancer have found that certain risk factors (e.g., smoking) are associated with specific cancers, and this suggests that different types of cancers probably have different causes. In this neighborhood, there were no apparent correlations among the different types of cancers diagnosed that would suggest that these cancers had the same cause.

This cancer review was conducted in response to concerns stated by a community member, not because the health assessment identified likely pathways of exposure that would lead to health affects among residents. To summarize, the incidence of invasive cancer among residents of the area was similar to the cancer incidence in Los Angeles County as a whole.

Conclusions

Based on the available information, CDHS and ATSDR conclude that the WDI Site currently poses no apparent health risk to those who live near it. However, the wastes on the site pose an indeterminate health hazard due to potential historical risk to people that worked or lived in the area prior to the site being filled and graded in 1966. Buried wastes present a potential future health hazard due to the potential future risk of buried wastes being exposed. In an effort to assess ambient air impacts from contaminants on the site, future ambient air monitoring should occur as close to the school and residential area as possible (IBM-51). Groundwater contamination in the vicinity of the WDI Site presents an indeterminate health hazard due to the potential future risk, if these contaminants get into the municipal water supply and no corrective measures are taken.

VOCs were detected in subsurface soil gas, in-building air, and background air at WDI. Elevated concentrations of VOCs and methane were detected in soil gas vapor probes and temporary soil gas probes located near on-site buildings. Based on the in-building air monitoring results and the on-site business chemical inventory, it is unlikely that soil gas infiltration from the WDI Site is the primary contributor to the contaminants in the in-building air. However, soil gas infiltration into site buildings is probably occurring to some degree. Irregardless of the degree of soil gas infiltration into site buildings, the levels of contaminants in air within the buildings are not a health concern because they are below occupational exposure thresholds.

The contaminated waste materials in the reservoir and in the waste sumps located adjacent to the reservoir, and the liquids in the reservoir do not pose a health concern for the majority of the site as there is no exposure to the contaminants because most of these areas are covered with five to 15 feet of fill material. The only exception to this is the 100-square-foot region of Area 5 that has less than 1 foot of fill material covering the subsurface contaminants. However, available data indicates the concentrations of contaminants in Area 5 do not pose a health concern, even if they were exposed.

Contaminated groundwater beneath the site does not pose a current health concern because no one is drinking the groundwater. Current information indicates that the groundwater beneath WDI is contaminated from sources other than WDI. Upgradient and cross-gradient of the site are several properties that have confirmed solvent releases. Future exposure to off-site contamination via municipal drinking water or private wells can not be ruled out. However, exposure to these contaminants appears unlikely because corrective procedures are in place should contamination impact the municipal water supply. Additionally, efforts are being made to remediate known groundwater contamination in the area.

CDHS-CSS and USC-CSP reviewed California Cancer Registry data on the incidence of cancer in Los Angeles County census tract 5029.02. This census tract includes the neighborhood in the vicinity of the WDI Site. The review found many different types of cancers. However, neither the cancer types diagnosed, nor the age at which diagnoses occurred, were different from what would be expected compared to California as a whole.

Recommendations to USEPA for Further Action

1. Ensure that the cap adequately covers the waste material contained in the reservoir and in the waste sumps so that casual physical disturbance of the cap will not result in exposure to contaminants.

2. Require institutional controls and/or deed restrictions to ensure that subsurface soil gases and the integrity of the cap will not be impacted by future developments on the WDI Site.

3. Monitor the groundwater beneath the site on a regular basis to determine the extent (vertically, horizontally, downgradient and crossgradient) of the migration of on-site waste materials.

4. Continue to collect ambient air data from location IBM-51 on the eastern portion of the site in addition to IBM-49 during all subsequent air sampling events (these on-site sampling locations are located adjacent to and near residential and school properties).

5. Ensure that the soil gas remedy is monitored regularly to ensure that soil gas does not impact on-site businesses, students and faculty at the St. John's High School, future developments on the WDI Site and off-site businesses and residents in the vicinity of the WDI Site.

6. Ensure that future site construction activities incorporate erosion control and dust mitigation mechanisms.

Public Health Action Plan

The Public Health Action Plan (PHAP) for this site contains a description of actions under consideration by ATSDR and CDHS at and near the site. The purpose of the PHAP is to ensure that this health assessment not only identifies public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. CDHS and ATSDR will follow up on this plan to ensure that actions are carried out.

Actions Conducted by CDHS at the WDI Site:

July 1998: CDHS begins process of updating 1993 site data.

February 1999: CDHS, EPA, and TOSC staff met with community members to explain the PHA process and learn whether the community thought that informal interviews would be a helpful way to gather health concerns information.

March 1999: CDHS staff interviewed community members to gather health concerns and document community participation and concerns.

August 1999: CDHS personnel visited the Waste Disposal Site and toured the site and vicinity

August 1999: CDHS attended Technical Meeting hosted by USEPA to keep appraised of site activities.

December 2000: CDHS conducts a cursorial inspection of the site and vicinity.

December 2000: CDHS met with representatives of PONC to discuss their concerns about the site and what outcomes they would like to see.

December 2000: CDHS attended Technical Meeting hosted by USEPA to keep appraised of site activities.

June 2002: CDHS releases Technical Comment Draft PHA for review by state, federal and local government agencies and regulatory bodies for technical merit.

September 2002: CDHS releases Public Comment Draft PHA for community review and comment. Public comments opened until December 2002.

November 2002: CDHS held discussions with TOSC to resolve comments associated with the Public Comment Draft.

January 2003: CDHS conducts a cursorial inspection of the site and vicinity.

January 2003: CDHS provides summary of PHA to community during USEPA public meeting addressing remedial activities at the WDI site.

Preparers of Report

Environmental and Health Effects Assessors

Greg Braun
Research Scientist
Impact Assessment, Inc., Consultant to
California Department of Health Services,
Environmental Health Investigations Branch

Sherry Chan, M.P.H.
Research Specialist
Impact Assessment, Inc., Consultant to
California Department of Health Services,
Environmental Health Investigations Branch

Marilyn C. Underwood, Ph.D.
Staff Toxicologist
California Department of Health Services,
Environmental Health Investigations Branch

Community Relations Coordinator

Primitivo Rojas, M.P.H.
Community Health Educator
California Department of Health Services,
Environmental Health Investigations Branch

ATSDR Regional Representative

William Nelson, M.S.
Gwen Eng
Regional Services, Region IX
Office of Regional Operations

ATSDR Technical Project Officer

Tammie McRae, M.S.
Environmental Health Scientist
Division of Health Assessment and Consultation
Superfund Site Assessment Branch, State Programs Section

Certification

This Public Health Assessment, Waste Disposal Inc., Sante Fe Springs, California, was prepared by the California Department of Health Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was begun.

Tammie McRae, MS
Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health assessment and concurs with the findings.

Roberta Erlwein
Chief, State Program Section, DHAC, ATSDR

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Appendix A - Glossary

GLOSSARY

Adverse Health Effect
A change in body function or the structures of cells that can lead to disease or health problems.

ATSDR
The Agency for Toxic Substances and Disease Registry. ATSDR is a federal health agency in Atlanta, Georgia that deals with hazardous substance and waste site issues. ATSDR gives people information about harmful chemicals in their environment and tells people how to protect themselves from coming into contact with chemicals.

Background Concentration
An average or expected amount of a chemical in a specific environment. Or, amounts of chemicals that occur naturally in a specific-environment.

Cancer Risk
The potential for exposure to a contaminant to cause cancer in an individual or population is evaluated by estimating the probability of an individual developing cancer over a lifetime as the result of the exposure. This approach is based on the assumption that there are no absolutely "safe" toxicity values for carcinogens. USEPA has developed cancer slope factors for many carcinogens. A slope factor is an estimate of a chemical's carcinogenic potency, or potential, for causing cancer.

If adequate information about the level of exposure, frequency of exposure, and length of exposure to a particular carcinogen is available, an estimate of excess cancer risk associated with the exposure can be calculated using the slope factor for that carcinogen. Specifically, to obtain risk estimates, the estimated, chronic exposure dose (which is averaged over a lifetime or 70 years) is multiplied by the slope factor for that carcinogen.

Cancer risk is the likelihood, or chance of getting cancer. We say "excess cancer risk" because we have a "background risk" of about one-in-four chances of getting cancer. In other words, in a million people, it is expected that 250,000 individuals would get cancer from a variety of causes. If we say that there is a "one-in-a-million" excess cancer risk from a given exposure to a contaminant, we mean that if one million people are exposed to a carcinogen at a certain concentration over their lifetime, then one cancer above the background chance, or the 250,000st cancer, may appear in those million persons from that particular exposure. In order to take into account the uncertainties in the science, the risk numbers used are plausible upper limits of the actual risk based on conservative assumptions. In actuality, the risk is probably somewhat lower than calculated, and, in fact, may be zero.

CERCLA
See Comprehensive Environmental Response, Compensation, and Liability Act.

Completed Exposure Pathway
See Exposure Pathway.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
CERCLA was put into place in 1980. It is also known as Superfund. This act concerns releases of hazardous substances into the environment, and the cleanup of these substances and hazardous waste sites. ATSDR was created by this act and is responsible for looking into the health issues related to hazardous waste sites.

Concern
A belief or worry that chemicals in the environment might cause harm to people.

Concentration
How much or the amount of a substance present in a certain amount of soil, water, air, or food.

Contaminant
See Environmental Contaminant.

Dermal Contact
A chemical getting onto your skin (see Route of Exposure).

Dose
The amount of a substance to which a person may be exposed, usually on a daily basis. Dose is often explained as the amount of substance(s) per body weight per day.

Dose / Response
The relationship between the amount of exposure (dose) and the change in body function or health that result.

Duration
The amount of time (days, months, years) that a person is exposed to a chemical.

Environmental Contaminant
A substance (chemical) that gets into a system (person, animal, or the environment) in amounts higher than that found in Background Concentration, or what would be expected.

Environmental Media
Usually refers to the air, water, and soil in which chemicals of interest are found. Sometimes refers to the plants and animals that are eaten by humans. Environmental Media is the second part of an Exposure Pathway.

Environmental Media Evaluation Guide (EMEG)
EMEGs are media specific values developed by ATSDR to serve as an aid in selecting environmental contaminants that need to be further evaluated for potential health impacts. EMEGs are based on non-carcinogenic end-points and do not consider carcinogenic effects. EMEGs are based on the MRLs.

Exposure
Coming into contact with a chemical substance.(For the three ways people can come in contact with substances, see Route of Exposure.)

Exposure Assessment
The process of finding the ways people come in contact with chemicals, how often and how long they come in contact with chemicals, and the amounts of chemicals with which they come in contact.

Exposure Pathway
A description of the way that a chemical moves from its source (where it began) to where and how people can come into contact with (or get exposed to) the chemical.

ATSDR defines an exposure pathway as having 5 parts:
1. A Source of Contamination
2. Environmental Media and Transport Mechanism
3. Point of Exposure
4. Route of Exposure
5. Receptor Population

When all five parts of an exposure pathway are present, it is called a Completed Exposure Pathway

Groundwater
Water beneath the earth's surface that flows through soil and rock openings, and often serves as a source of drinking water.

Hazardous Waste
Substances that have been released or thrown away into the environment and, under certain conditions, could be harmful to people who come into contact with them.

Interim Threshold Screening Limits (ITLs)
USEPA has determined ITLs for over twenty chemical contaminants related to the solvent and petroleum wastes disposed at the WDI Site. Of these twenty chemicals, six gaseous chemical contaminants characterize the soil gas contaminants and wastes at the WDI Site based on toxicity or frequency of detection (38). These ITLs are tailored to the particular conditions at the WDI Site, thus, they should not be applied to other sites without adjusting for corresponding specific characteristics of those sites (38). The exposure assumptions used to develop the ITLs are: 1) the population being evaluated is workers who occupy buildings on the WDI Site; 2) inhalation is the route of exposure being evaluated; 3) workers in offices built on slab-on foundations could be exposed to 1% (i.e., 1/100 attenuation factor) of the concentration of vinyl chloride/benzene vapors found in adjacent vapor wells; 4) the duration of exposure is assumed to be 25 years for chronic health concerns; and 5) exposure factors default values used include: indoor respiration rate of 15 cubic meters per day (m^3/day), exposure frequency of 250 days/year, and an average body weight of 70 kilograms (kg) (38). In order to evaluate the potential impact of subsurface landfill gas upon the in-building air quality of the office buildings

located on the WDI Site, an attenuation factor of 0.01 or 1% was assumed based on the baseline risk assessment investigation conducted by USEPA for the WDI Site in 1989 (38). This attenuation factor relates the subsurface soil gas concentrations to in-building air concentrations and provides a way to conservatively estimate screening concentration of air concentrations of chemical contaminants in buildings (38).

Maximum Contaminant Level (MCL)

The USEPA has issued drinking water standards, or MCLs for more than 80 contaminants in drinking water. The MCLs are set based on known or anticipated adverse human health effects (which also account for sensitive subgroups, such as, children, pregnant women, the elderly, etc.), the ability of various technologies to remove the contaminant, their effectiveness, and cost of treatment. For cancer risk, USEPA generally sets the MCLs at concentrations that will limit an individual risk of cancer from a contaminant to between 1 in 10,000 (low increased excess risk) to 1 in 1,000,000 (no apparent increased excess risk) over a lifetime. As for non-cancer effects, USEPA estimates an exposure concentration below which no adverse health effects are expected to occur.

Methane Standard

Methane is a odorless explosive gas that is produced by the degradation of wastes in landfills. Unless methane is controlled, it can build up in landfill and migrate to nearby buildings creating a fire and explosion hazard. At high concentrations, approximately 33%, methane acts as an asphyxiant by causing oxygen deprivation in humans (37). Methane has no other known health effects. Under Title 27 California Code of Regulations (27CCR) Section 20919.5, the California Integrated Waste Management Board (CIWMB) required that the concentrations of methane gas generated from landfill does not exceed 1.25% by volume in on-site structures, excluding landfill gas control buildings, nor 5% by volume at the property boundary (at any depth) [37]. The lower explosive limit (LEL) for methane is 5% and the upper explosive limit is 15%. Thus, methane vapor concentrations between 5% and 15% will produce a fire or explosion if an ignition source is present.

Non-Cancer Evaluation ATSDR's Minimal Risk Level (MRL) and USEPA's Reference Dose (RfD) and Reference Concentration (RfC)

The MRL, RfD and RfC are estimates of daily exposure to the human population (including sensitive subgroups), below which non-cancer adverse health effects are unlikely to occur. The MRL, RfD and RfC only consider non-cancer effects. Because they are based only on information currently available, some uncertainty is always associated with the MRL , RfD. and RfC. "Safety" factors are used to account for the uncertainty in our knowledge about their danger. The greater the uncertainty, the greater the "safety" factor and the lower the MRL, RfD, or RfC.

When there is adequate information from animal or human studies, MRLs and RfDs are developed for the ingestion exposure pathway, whereas, RfCs are developed for the inhalation exposure pathway. A MRL, RfD or RfC is an estimate of daily human exposure to a substance that is likely to be without an appreciable risk of adverse (non-carcinogenic) health effects over a specified duration of exposure. No toxicity values exist for exposure by skin contact. Separate non-cancer toxicity values are also developed for different durations of exposure. ATSDR

develops MRLs are acute exposures (less than 14 days), intermediate exposures (from 15 to 364 days), and for chronic exposures (greater than one year). USEPA develops RfDs and RfCs for acute exposures (less than 14 days), subchronic exposures (from two weeks to seven years), and chronic exposures (greater than seven years). Both the MRL and RfD for ingestion are expressed in units of milligrams of contaminant per kilograms body weight per day (mg/kg/day). The RfC for inhalation is expressed in units of milligrams per cubic meter (mg/m^3).

Non-Cancer and Cancer Evaluations USEPA's Preliminary Remediation Goals (PRGs)
PRGs are developed by the USEPA to estimate contaminant concentrations in the environmental media (soil, air, and water), both in residential and industrial settings, that are protective of humans, including sensitive groups, over a lifetime (6). PRGs were developed for both industrial and residential settings because of the different exposure parameters, such as, different exposure time frames (e.g., industrial setting: workers are exposed for 8 hours/day and 5 days/week vs. residential setting: families are exposed 24 hours/day and 7 days/week; and different "human" exposure points (e.g., industrial setting: healthy adult males vs. residential setting: males, females, young children, and infants), etc. Media concentrations less than the PRGs are unlikely to pose a health threat; whereas, concentrations exceeding a PRG do not automatically determine that a health threat exists, but suggest that further evaluation is necessary.

NPL
The National Priorities List. (Which is part of Superfund.) A list kept by the U.S. Environmental Protection Agency (EPA) of the most serious, uncontrolled or abandoned hazardous waste sites in the country. A NPL site needs to be cleaned up or is being looked at to see if people can be exposed to chemicals from the site.

PHA
Public Health Assessment. A report or document that looks at chemicals at a hazardous waste site and tells if people could be harmed from coming into contact with those chemicals. The PHA also tells if possible further public health actions are needed.

Plume
A line or column of air or water containing chemicals moving from the source to areas further away. A plume can be a column or clouds of smoke from a chimney or contaminated underground water sources or contaminated surface water (such as lakes, ponds and streams).

Point of Exposure
The place where someone can come into contact with a contaminated environmental medium (air, water, food or soil). For examples: the area of a playground that has contaminated dirt, a contaminated spring used for drinking water, the location where fruits or vegetables are grown in contaminated soil, or the backyard area where someone might breathe contaminated air.

Population
A group of people living in a certain area; or the number of people in a certain area.

PRP:
Potentially Responsible Party. A company, government or person that is responsible for causing the pollution at a hazardous waste site. PRP's are expected to help pay for the clean up of a site.

Public Health Assessment(s)
See PHA.

Public Health Hazard
The category is used in PHAs for sites that have certain physical features or evidence of chronic, site-related chemical exposure that could result in adverse health effects.

Public Health Hazard Criteria
PHA categories given to a site which tell whether people could be harmed by conditions present at the site. Each are defined in the Glossary. The categories are:

A. Urgent Public Health Hazard: Short-term exposures (<1yr.) To hazardous substances could cause adverse health effects that require rapid intervention.
B. Public Health Hazard: Long-term exposure to hazardous substances could cause adverse health effects.
C. Indeterminate Public Health Hazard: This category is used for a site when a professional judgement on the level of health hazard cannot be made due to lacking information.
D. No Apparent Public Health Hazard: Exposure to contaminated media may have occurred in the past, be occurring now or may occur in the future, but this exposure is not expected to cause adverse health effects.
E. No Public Health Hazard: This category is used for site with no exposure.

Route of Exposure
The way a chemical can get into a person's body. There are three exposure routes:
- breathing (also called inhalation),
- eating or drinking (also called ingestion), and
- or getting something on the skin (also called dermal contact).

Semivolatile Organic Compound (SVOC)
A chemical compound that partially evaporates or changes from liquid to gas at room temperature.

Source (of Contamination)
The place where a chemical comes from, such as a landfill, pond, creek, incinerator, tank, or drum. Contaminant source is the first part of an Exposure Pathway.

Special Populations
People who may be more sensitive to chemical exposures because of certain factors such as age, a disease they already have, occupation, sex, or certain behaviors (like cigarette smoking). Children, pregnant women, and older people are often considered special populations.

Superfund Site
See NPL.

Time Weighted Average (TWA) - Eight Hour
The TWA is a threshold limit value that represents the amount of a chemical or substance that a worker can be exposed to over an eight hour work day, five days per week without experiencing adverse health effects.

Toxic
Harmful. Any substance or chemical can be toxic at a certain dose (amount). The dose is what determines the potential harm of a chemical and whether it would cause someone to get sick.

Toxicology
The study of the harmful effects of chemicals on humans or animals.

Urgent Public Health Hazard
This category is used in ATSDR's PHA documents for sites that have certain physical features or evidence of short-term (less than 1 year), site-related chemical exposure that could result in adverse health effects and require quick intervention to stop people from being exposed.

Volatile Organic Compound (VOC)
A chemical compound that evaporates (volatilizes) or changes from liquid to gas readily at room temperature.

Appendix B - Tables

Table 1: California Department of Health Services Monitoring Frequency Guidelines for municipal water (40)

Parameters to be Sampled	Frequency
Organic chemicals (i.e., regulated under Title 22)	• Annually if none detected; • Quarterly if "hits" are detected but less than MCLs; or • Monthly if "hits" are greater than MCLs.
Organic chemicals (i.e., unregulated)	VOCs - Once/5 years, exceptions: • MTBE - Once/3 years or annually as part of the VOCs, • TAME - Once every 5 years if MTBE is detected, • ETBE - Once every 5 years if MTBE is detected. SVOCs - Waived.
Inorganic chemicals (i.e., regulated under Title 22)	Once/3years, exceptions: • Asbestos - one distribution system sample every 9 years; • Cyanide - waived; • Fluoride - every 3 years, if > MCL, then switch to a quarterly sampling frequency; • Iron - every 3 years; if > MCL, then monthly sampling for 1 year; • Manganese - every 3 years; if > MCL, then monthly sampling for 1 year; • Nitrate - Annually, if < ½ MCL; Quarterly, if > ½ MCL, but < MCL; and Monthly, if > MCL (with treatment only); • Nitrite - Every 3 years if < ½ MCL; Quarterly if > ½ MCL, but < MCL; and Monthly, if > MCL (with treatment only).
Inorganic chemical (i.e., unregulated) = Perchlorate	4 consecutive quarters of sampling from all sources every 5 years.

TAME - tertiary-amyl methyl ether: a fuel oxygenate
MTBE - methyl-tertiary butyl ether: a fuel oxygenate
ETBE - ethyl-tertiary butyl ether: a fuel oxygenate

Table 2: List of unregulated organic chemicals monitored in the City of Santa Fe Springs Municipal Water System (40)

Volatile Organic Chemicals (VOCs)	Non-Volatile Synthetic Organic Chemicals (SOCs)
Bromobenzene Bromodichloromethane Bromoform Chlorodibromomethane Chloroethane Chloroform Chloromethane 2-Chlorotoluene 4-Chlorotoluene Dibromomethane 1,3-Dichlorobenzene Dichlorodifluoromethane 1,3-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene 1,1,1,2-Tetrachloroethane 1,2,3-Trichloropropane Bromochloromethane n-Butylbenzene sec-Butylbenzene tert-Butylbenzene Hexachlorobutadiene Isopropyltoluene p-Isopropyltoluene 1-Phenylpropane 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,3,5-Trichlorobenzene Methyl tert-butyl ether (MTBE) Tert-amyl methyl ether (TAME) Ethyl tert-butyl ether (ETBE)	Bromacil Chlorothalonil Dimethoate Diuron Naphthalene Phthalates Polycyclic Acrylic Hydrocarbons (PAHs) Prometryn 2,4,5-T Aldrin Butachlor Carbaryl Dicamba Dieldrin 3-Hydroxycarbofuran Methomyl Metribuzin Propachlor

Table 3: List of Contaminants Released to the Environment in the Vicinity of the Waste Disposal, Inc. Site (17)
Acetone
Aluminum (fume or dust)
Aluminum Oxide (fibrous forms)
Ammonia
Ammonium Sulfate
Antimony
Asbestos (friable)
Barium Compounds
Benzene
Chlorine
Chromium
Copper Compounds
meta-cresol
para-cresol
Cyclohexane
Dichloromethane
Diethanolamine
Ethylbenzene
Ethene
Ethylene Oxide
Glycol Ethers (certain types)
Hydrochloric Acid
Lead
Lead Compounds
Methanol
Methyl Ethyl Ketone
Molybdenum Trioxide
Nickel
Nickel Compounds
Nitric Acid
Nitrilotriacetic Acid
Phenol
2-Phenyphenol
Phosphoric Acid
Propene
Sodium Hydroxide (solution)
Styrene
Sulfuric Acid
Tetrachloroethane (PCE)
Toluene
1,1,1-Trichloroethane
Trichloroethene (TCE)
Xylene (mixed isomers)
Zinc Compounds

Table 4: Subsurface soil gas and in-building air Interim Threshold Levels (ITLs) for chemicals of concern detected at the Waste Disposal, Inc. Site (9)

Contaminant	Soil Gas Threshold Value (ppbv)	In-Building Air Interim Threshold (ppbv)	Site Boundary Interim Threshold (ppbv)
Methane	5%	1.25%	1.25%
Acetone	31,200	312	15,600
Benzene	200	2	100
Carbon Tetrachloride	68	0.68	34
Chloroform	340	3.4	170
Dibromoethane	6	0.06	3
cis-1,2-Dichloroethene	1,860	18.6	930
1,1-Dichloroethane	25,600	256	12,800
1,2-Dichloropropane	186	1.86	93
trans-1,2-Dichloroethene	3,680	36.8	1,840
Ethylbenzene	49,000	490	24,500
Tetrachloroethene (PCE)	1,064	10.6	532
Toluene	21,200	212	10,600
1,1,2-Trichloroethane	440	4.4	220
1,1,1-Trichloroethane	36,800	368	18,400
Trichloroethene (TCE)	822	8.2	411
Vinyl Chloride	25	0.25	12.5
m, and p-Xylenes	14,280	142.8	7,140
o-Xylene	14,280	142.8	7,140

Note:
Site boundary threshold values were used to assess vapor well concentrations on or near the perimeter of the WDI Site.

ppbv = parts per billion by volume

Table 5: List of chemical contaminants that were analyzed for in soil gas samples collected from the vapor wells and the temporary probes at the Waste Disposal, Inc. Site (9)

Dichlorodifluroromethane	Toluene
Chloromethane	trans-1,3-Dichloropropene
Vinyl Chloride	1,1,2-Trichloroethane
1,2-Dichloro-1,1,2,2-tetrachloroethane	Dibromochloromethane
Bromomethane	4-Methyl-2-pentanone
Chloroethane	Trichloroethane
1,1-Dichloroethene (1,1-DCE)	1,3-Dichloropropane
Trichlorofluoromethane	2-Hexanone
1,1,2-Trichloro-1,2,2-trifluororoethane	1,2-Dibromoethane
Acetone	Chlorobenzene
Carbon Disulfide	Ethylbenzene
Methylene Chloride	m & p- Xylene
trans-1,2-Dichloroethene (trans-1,2-DCE)	o-Xylene
1,2-Dichloroethane	Styrene
cis-1,2-Dichloroethene	Bromoform
2-Butanone	1,1,2,2-Tetrachloroethane
Chloroform	1,3,5-Trimethylbenzene
1,1,1-Trichloroethane (1,1,1-TCA)	1,2,4-Trimethylbenzene
Carbon tetrachloride	1,2,3-Trichloropropane
Benzene	1,3-Dichlorobenzene
1,2-Dichloroethane	1,4-Dichlorobenzene
Trichloroethene (TCE)	1,2-Dichlorobenzene
Bromodichloromethane	1,2-Dibromo-3-chloropropane
1,2-Dichloropropane	Methane
cis-1,3-Dichloropropene	

Table 6: Volatile Organic Compounds (VOCs) detected in the temporary soil gas probes above the Interim Threshold Levels (ITLs) at the Waste Disposal, Inc. Site (9)

VOCs	Vapor Wells with Soil Gas Concentrations Above ITLs	Maximum Concentration of VOCs Detected in the Temporary Soil Gas Probes (ppb)
Benzene	GP-7, GP-9, GP-12, GP-40, GP-41, GP-48, GP-172, GP-175, GP-186	GP-175 17,000
Vinyl chloride	GP-9, GP-40, GP-41, GP-78, GP-172	GP- 40 1,600
Chloroform	GP-12, GP-175	GP-12 2,700
PCE	GP-31, GP-172	GP-31 670
Xylene	GP-12	18,000
1,2-Dichloropropane	GP-78	230
1,2-Dibromoethane	GP-175	48

GP-31 located along the WDIG site boundary adjacent to 9483 Greenleaf Avenue (9).

GP-172 & GP-175 located approximately 100 feet east of the building at 12637B Los Nietos Road (9).

GP-78 located near VW-17 at 9756 Santa Fe Springs Road (9).

Table 7: Volatile Organic Compounds (VOCs) detected in the soil gas vapor wells above the Interim Threshold Levels (ITLs) at the Waste Disposal, Inc. Site (9)

VOCs	Vapor Wells with Soil Gas Concentrations Above ITLs	Maximum Concentration of VOCs Detected in the Vapor Well (ppb)
Vinyl chloride	VW-4, VW-8, VW-9, VW-10, VW-14, VW-22, VW-23, MP-1, MP-2	VW-9 1,700
Benzene	VW-4, VW-9, VW-10, VW-18, VW-22, MP-1, MP-2	VW-9 19,000
Trichloroethene (TCE)	VW-22, VW-23, MP-2	VW22 2,200
Chloroform	VW-18, MP-1	VW-18 820
1,2-Dibromoethane	VW-24, MP-1	VW-24 & MP-1 48
Tetrachloroethene (PCE)	VW-23	55
Carbon tetrachloride	VW-8	59
Xylene	VW-9	23,000
1,2-Dichloropropane	VW-14	130

Vinyl chloride and benzene were the only two chemical contaminants that were detected above ITLs in both the August and September soil gas sampling investigations.

VW-9 is located near the center of the reservoir in Area 2.

Table 8: Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Bert's Automobile 128098 Los Nietos Rd Date of Inspection: 11/20/97	Safety-Kleen Solvent Tank (20-gallons), Waste oil (55-gallon drum) The following spray cans were located in the building: Carburetor and Choke Cleaner, Anti-Seize Lubricant, Brake-Parts Cleaner, Sandible Primer, Air Filter Cleaner, Orr-Lac Engine Paint, WD-40 Small cans (less than 1-gallon): grease can, 1-Liter Odorless Paint Thinner, Gasket Sealer, 1-gallon One Lube Antifreeze Coolant, grease guns, Air Filter Oil, Car Cleaner Wax. Note: no chemicals used in office where sample was collected		Methylene chloride (2.0) **Benzene (17. 0)*** Toluene (120) Trichloroethane (1.8) Ethylbenzene (19.0) m & p-Xylene (75.0) o-Xylene (26.0) Styrene (4.9) 1,3,5-Trimethylbenzene (6.6) 1,2,4-Trimethyfbenzene (22.0)
Leo's Lawnmowers 1 2 81 1 C Los Nietos Rd Date of Inspection: 11/20/97	Safety-Kleen Solvent Tank (20-gallons), 2-gallon gas can, SAE Motor Oil (30 1-quart bottles), 2 Cycle Power Equipment Oil (40 to 50 0.4-Liter bottles) The following spray cans were located in the building: Carb Cleaner, WD-40, Brake Parts Cleaner, Gloss Enamel Spray Coating, Paint and Chain Lube, Chain and cable fluid. Fifteen lawnmowers were located inside the building. Chickens are also raised inside the building. No chemicals were used inside the office where the sample was collected.		Methylene chloride (8.0) **Benzene (61.0)*** **Toluene (380)*** Ethylbenzene (91.0) **m & p-Xylene (s) (330)*** o-Xylene (120.0) 1,3,5-Trimethylbenzene (38.0) 1,2,4-Trimethylbenzene (100.0)
Hernandez Auto 1281 1 D Los Nietos Rd Date of Inspection: 11/20/97	Solvent in small tray to clean auto parts (brand name or specific chemical not known (1-gallon of solvent in gas can), waste oil (5-gallons). 1-gallon paint thinner, 1-gallon primer thinner, 1-gallon antifreeze, 1 -gallon SAE 30 motor oil, brake fluid (6 1 -Liter cans). The following spray cans were located in the building: spray paint, engine paint, undercoating, WD-40, Engine-Brite, heavy duty engine degreaser. Note: At time of inspection there was a strong odor of paint thinner and a small open tray of parts cleaning solvent present in the building. Workers were doing body work on cars which included the removal of paint, patching his car with putty, and painting his car. Hernandez Auto specializes in the repair of engines. The shop repairs automobiles. The sample was collected in the back of the shop and could have been exposed to any of the chemicals used within the building.		Methylene chloride (38.0) **Benzene (17.0)*** Toluene (150.0) **Tetrachloroethene (61.0)*** Ethylbenzene (27.0) m & p-Xylene(s) (99.0) o-Xylene (37.0) Styrene (7.6) 1,1,2,2-Tetrachloroethane (1.4) 1,3,5-Trimethylbenzene (10.0) 1,2,4-Trimethylbenzene (29.0) 1,4-Dichlorobenzene (33.0)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
12741 Los Nietos Rd. Date of Inspection: 11/20/97	Safety-Kleen Solvent Tank (20-gallons), 55-gallon drum of Zep Solvent (DYNA 143) 2-gallons of gas 2 55-gallon drums of waste oil Spray cans of water-based paint According to site operator, no chemicals are stored or used in the room where the samples were collected.		Methylene chloride (0.85) 1,1,1-Tetrachloroethane (30.0) Toluene (15.0) Ethylbenzene (2.4) m & p-Xylene(s) (9.7) o-Xylene (3.8) Styrene (1.5) 1,3,5 -Trimethlybenzene (2.5) 1,2,4-Trimethylbenzene (7.7)
D & H Laminating 12707 and 12717 Los Nietos Rd Date of Inspection: 11/20/97	According to site operator, the only chemical used in their building is the glue used in their laminating process. Site personnel said the glue is water-based. She could not find the MSDS for the glue. At the time of the inspection, the following vehicles were used at this business: fork lifts, saws, presses, and glue spreaders. No wood finishing is conducted at this business. The fork-lifts use propane and are serviced here. According site operator, no waste oil is stored at this building.		Methylene chloride (0.61) 1,1,1-Trichloroethane (28.0) Styrene (1.2) 1,2,4-Trimethylbenzene (1.1)
Dry Print Foils 9620 B Santa Fe Springs Rd Date of Inspection: 11 /20/97	This business makes dry print foils for business cards. The primary chemical used at this business is Super 77 Spray Adhesive (bonding agent containing hexane and other hydrocarbons). No paint thinners or solvents are used in this building. Sometimes, not often, this business used paint. No chemicals were used in the office where the indoor air sample was collected.		No data available for this building. Sample was collected at 9618 Springs Rd #8. The business at 961 8 was also called dry print, but a new business is now located at 9618 #8.
Action Maintenance 9620 A Santa Fe Springs Rd Date of Inspection: 11/20/97	At the time of inspection, the following spray cans were identified: Teflon Lubricant (contains hydrocarbons), Sheen-15 (protective coating and conditioner), Solvent Sprez (nonflammable safety solvent containing chlorinated solvents), Lemon Luster, Red Gasket Maker (100 % silicon rubber), Mountain Air Deodorant, Dazzle-A Glass Cleaner, Off-Vandalism Graffiti Remover (contains Toluene), Ban-Rust (contains mineral spirits CAS #64742-88-7). All of the above cans were located in a box in the same room that the indoor air sample was collected. The site operator does not think the cans were in the room when the sample was collected, but he is not sure. This building also contains a warehouse full of chemicals for mostly janitorial supplies such as WD-40. No open cans are located in the warehouse. Chemicals are only distributed at this business.		Trichlorofluoromethane (0.3) 1,1,2-Trichloro-1,2,2-trifluoroethane (0.3) Methylene chloride (4.0) 1,1,1-Trichloroethane (2.0) Trichloroethene (0.7) Toluene (9.0) **Tetrachloroethene (12.0)*** Styrene (0.3)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Brothers Machine Shop 9843 Greenleaf Ave. Date of inspection: 1/7/98	According to the site operator, the only chemical used at their facility is hydraulic oil for their machines (Western Basic Soluble Oil) and diesel fuel for their vehicles. Diesel fuel is stored in one 5-gallon gas can in the north corner of the building. There were three 5-gallon containers of oil stored in plastic buckets inside the building. No MSDS was available for review.	Several cans of WD-40 spray lubricant which contains methyl ethyl ketone and toluene along with many VOCs.	Trichlorofluoromethane (0.4) Methylene chloride (0.8) Toluene (8.6) Tetrachloroethene (1.5) Ethylbenzene (1.1) m & p-Xylene(s)(4.4) 1,3,5-Trimethylbenzene (0.2)
9618 #8 Santa Fe Springs Rd. Date of Inspection: 1/7/98	The site operator opened his business at this location approximately 2 months ago. His business was not operating at this location when the indoor air sample was collected at this building. The business which operated at this location when the sample was collected was called Dry Print.		Dichlorofluoromethane (0.6) Trichlorofluoromethane (0.3) 1,1,2-Trichloro-1,2,2-trifluoroethane (0.3) Methylene chloride (47) 1,1,1-Trichloroethane (2.0) Toluene (12. 0) Ethylbenzene (0.8) 1,3,5-Trimethylbenzene (0.2)
E & L Electric 9632 Santa Fe Springs Rd Date of Inspection: 1/7/98	The main chemicals used at this building are the Safety-Kleen solvent tank and the varnish. The following information was provided in the Material Safety Data Sheet (MSDS) for the Safety-Kleen solvent and the varnish: *Safety Kleen 105 Solvent Recycled-California* Hazardous Components - hydrotreated light petroleum distillates (Petroleum Naphtha (99-100%); Tetrachloroethene (0 - 0.5%); 1,1,1-Trichloroethane (0 - 0.5%). The Safety-Kleen solvent also contains detectable amounts of benzene, carbon tetrachloride, 1,4-dichlorobenzene, dichloroethane, toluene, and trichloroethene. Polyester Resin Solution *Hazardous component - organic peroxide* (1.0 - 1.4% by weight)	E & L Electric was replaced by Gold Coast Refractory. Identified various paints, spray lubricants (WD-40), and foam insulation products. *Refractory units operate on some weekends,* which may contribute to airborne volatile organic compound load.	Dichlorofluoromethane (0.7) 1,1-Dichloroethene (0.3) Trichlorofluoromethane (0.4) Methylene chloride (1.0) 1,1,1-Trichloroethane (0.91) Benzene (2.0) **Trichloroethene (14.0)*** Toluene (1 5.0) Tetrachloroethene (1.0) Ethylbenzene (1 3. 0) m, p-Xylene(s) (23.0) o-Xylene (21.0) 1,3,5-Trimethylbenzene (0.5) 1,2,4-Trimethylbenzene (2.0) 1,2-Dichlorobenzene (1.2)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Mersits Equipment 9640 Santa Fe Springs Rd. Date of Inspection: 1/7/98	No chemicals are stored in the office where the SUMMA canister was set, but numerous spray cans were located in the adjacent room. The following spray cans were observed: WD-40, yellow paint (containing acetone, propane, mineral spirits), brake fluid (alkylene glycols), Rust-Oleum, Engine Brite (no chlorinated solvents), Fleck Stone Clear Acrylic Topcoat Gel-Gloss Fibergloss.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.4) Methylene chloride (3.0) 1,1,1-Trichloroethane (2.0) Toluene (8.0) Ethylbenzene (2.0) o-Xylene (2.0) 1,3,5-Trimethylbenzene (0.3)
California Reamer 12747 Los Nietos Rd. Date of Inspection: 1/7/98	According to the site operator, the following chemicals are used at this facility: Ultraflux Silver Brazing Flux, which contains potassium tetraborate, boric acid, daolin, and borax; water soluble coolant, which contains paraffin selective refined component, fatty acid polydiethanol amide, sulfonated oils, oleoyl-sarcoside, 1,2-propylene glycols, boric acid ester, high temperature stabilized chloroparaffin; Cutzol WS-5050 coolant by Rust-Lick Products; Grinding Fluid-water soluble machining fluid containing ethanoline; Lube oil of highly refined base oils; Premium Safety-Kleen 105 Solvent (MSDS not available). During the inspection Mr. Neptune said that when the sample was collected inside this building there were vinyl-based paints, gas, and paint thinner in the same room as the SUMMA canister		Dichlorofluoromethane (0.8) Methylene chloride (1.0) Tetrachloroethene (0.4) Ethylbenzene (0.8) Styrene (0.4) 1,3,5-Trimethlybenzene (0.3)
9618 #1 5 Santa Fe Springs Rd. Date of Inspection: 1/7/98	No one there at time of inspection, thus no chemical use information was obtained.		Dichlorofluoromethane (0.9) Trichlorofluoromethane (0.3) Methylene chloride (3 .0) 1,1,1-Trichloroethane (2.0) Toluene (1 5) Ethylbenzene (1.0) m & p-Xylene(s) (4.0) Styrene (0.6) 1,3,5-Trimethylbenzene (0.4)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Metro Diesel 12631 Los Nietos Rd. Date of Inspection: 1/7/98	According to the site operator, this facility has a Safety-Kleen Solvent Tank and waste oil. Only Clorox bleach and a bathroom detergent were present in the bathroom that the SUMMA canister was set in. Chemical information was provided by the site operator from the MSDS's. The MSDS information is provided below. Safety-Kleen 105 Parts Washing Solvent (Components): C9-C 13 Saturated Hydrocarbon (85%); Toluene (0.5%); Xylene (1.0%); Ethylbenzene (0.5%); CB + Aromatics (12.0%), 1,1,1-Trichloroethane(<0.5%); Tetrachloroethene (<0.5%). Calibration Fluid 1487 AW-2 (Components): Petroleum Distillate (60-75 %); Straight run midddle distillate (1 5-40%); other ingredients (1-10%). Safety-Kieen Immersion Cleaner and Cold Parts Cleaner 699 (Components): Aromatic 1 50 or heavy aromatic naphtha cleaning solvent; N-methyl-2-pyrolidone; Dipropylene glycol; Methyl ether; Monoethanolamine; Oleic acid; water.		Dichlorofluoromethane (0.8) Trichlorofluoromethane (0.3) Methylene chloride (21 0) Chloroform (0.6) Toluene (1 3.0) Tetrachloroethene (0.8) Ethylbenzene (1.0) m & p-Xylene(s) (4.0) o-Xylene (2.0) 1,3,5-Trimethylbenzene (0.9) 1,2,4-Trimethylbenzene (3.0)
Buffalo Bullet 12637A Los Nietos Rd. Date of inspecton: 11/20/97 and 1/7/97	Only the secretary was there at the time of both inspections	Various cleaning solvents (Safety-Kleen, kerosene and naphtha) used during degreasing.	Trichlorofluoromethane (0.3) Methylene chloride (4.0) 1,1,1-Trichlorethane (3.0) Chlorobenzene (0.6) Ethylbenzene (0.5) Styrene (2.0)
C & E Die Fabrications 12637B Los Nietos Rd Date of Inspection: 11/20/97	15 gallons of cleaning solvent (UN-1 255 Petrolube, Inc). Cutting oil, 15 gallons of machine oil, 15 gallons of turbine oil, 15-gallons of Metal Working Fluid (Grade 503), 1 5 gallons of Soluble Oil, 1-gallon of parts cleaning solvent (open can in warehouse). Note: the indoor air sample was collected in the northeast corner of the warehouse.	Identified various cleaning solvents including naphtha, lacquer thinner, kerosene and parts dip. Spray lubricants were also observed.	Trichlorofluoromethane (0.3) Methylene Chloride (5.0) 1,1,1-Trichloroethane (3.0) Toluene (6.9) Tetrachloroethene (0.43)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Air Liquids 9756 Santa Fe Springs Rd. Date of Inspection: 1/7/98	At the time of inspection, no one available to provide escort. The secretary provide a business card and suggested talking to the site operator.		Methylene chloride (1.1 0) 1,1,1-Trichloroethane (1.90) Toluene (5.7) Tetrachloroethene (0.57) Ethylbenzene (1.0) m & p-Xylene(s) (4.8) o-Xylene (1.8) 1,2,4-Trimethylbenzene (3,O)
Four C's Transmission 12807A Los Nietos Rd Date of Inspection: 11/20/97	Safety-Kleen Solvent Tank (2 0-gallons). Waste oil (55-gallon drum) The following spray cans were located in the building: Formula 409 All Purpose Cleaner, Son-of-a-gun vinyl protectant, Raid Ant cleaner, Clean Start, Formula 529 Cleaner, Carb-Chok Cleaner, and Carpet Cleaner. Note: the carpet cleaner was the only chemical used in the office where the sample was collected.		Dichloroflouromethane (3.4) Methylene chloride (3.6) Benzene (2.7) Toluene (21.0) Ethylbenzene (5.1) m & p-Xylene(s) (21.0) o-Xylene (8.5) Styrene (1 .4) 1 3,5-Trimethylbenzene (4.2)
12801 Los Nietos Rd. Date of Inspection: 1/7/98	This building is locked and does not appear to be occupied by anyone.		Trichloroflouromethane (0.4) Methylene chloride (2.0) Toluene (7.0) Chlorobenzene (2.0) Ethylbenzene (2.0) m & p-Xylene(s) (6.0) o-Xylene (2.0) Styrene (1.0) 1,3,5-Trimethylbenzene (3.0) 1,2,4-Trimethylbenzene (11.0)
Bell Auto Body Date of Inspection: 1/7/98	According to site operator, their facility mostly uses paint, paint thinner, and various oils including WD-40. The business is an autobody shop and is surrounded by used cars including a car inside the shop.	Various fiberglass resins, acetone, and catalysts were observed. Various spray cans containing paints, lubricants and primers were identified. Gasoline cans were also observed in the building.	Dichlorofluoromethane (0.9) Trichlorofluoromethane (0.3) Methylene Chloride (1.0) Benzene (3.0) Toluene (81) Ethylbenzene (7.0) m & p-Xylene(s) (23.0) o-Xylene (7.0) 1,3,5-Trimethylbenzene (0.2) 1,2,4-Trimethylbenzene (2.0)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Lift Truck Converter (Duplicate Sample) 9610 Santa Fe Springs Rd. Date of Inspection: 1/7/98	This business uses a paint booth, oil, grease, and Safety-Kleen 105 Recycled Solvent.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.3) Methylene chloride (11 .0) 1,1,1-Trichloroethane (1.6) **Benzene (6.0) *** Trichloroethene (0.3) Toluene (48) Tetrachloroethene (3.0) Ethylbenzene (7.0) — & p-Xylene(s) (24.0) o-Xylene (9.0) 1,3,5-Trimethylbenzene (3.0) 1,2,4-Trimethylbenzene (9.0)
Lift Truck Converter 961 0 Santa Fe Springs Rd. Date of Inspection: 1/7/98	This business uses a paint booth, oil, grease, and Safety-Kleen 105 Recycled Solvent.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.3) 1,1,2-Trichloro-112,2-triflouroethane (0.3) Methylene Chloride (1 9.0) **Benzene (9.0) *** 1,2-Dichloroethane (0.2) Trichloroethene (0.5) Toluene (75) Tetrachloroethene (3.0) Ethylbenzene (1 1.0) — & p-Xylene(s) (45.0) o-Xylene (1 6.0) 1,3,5-Trimethylbenzene (5.0) 1,2,4-Trimethylbenzene (15.0)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
9608 Santa Fe Springs Rd. Date of Inspection: 1/7/98	The tenant was not there at the time of the inspection. The tenant uses this building to store paint. Various types of paints such as acrylic latex enamel and semi-gloss enamel were observed in the building by looking through the window. No paint thinner was seen in the building.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.3) Methylene chloride (60) **Benzene (32.0) *** 1,2-Dichloroethane (0.6) 1,2-Dichloropropane (0.4) **Toluene (250) *** Tetrachloroethene (1.0) Ethylbenzene (39.0) — & p-Xylene(s) (1 50) o-Xylene (58.0) Styrene (2.0) 1,1,2,2-Tetrachloroethane (10.0) 1,3,5-Trimethylbenzene (18.0) 1,2,4-Trimethylbenzene (73.0)
Durango Designs Date of Inspection: 1/7/98	Chemicals used at this facility include paint thinner (mineral, acetone, and Weld-On Solvent Cement Acrylic (contains mostly methylene chloride). A glass cleaner called Kleenwaste Brillianize is also used. Chemicals are stored in a locker located on the opposite side from where the SUMMA canister was set.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.4) Chloroform (1.0) 1,1,1-Trichloroethane (1 .0) Trichloroethene (2.0) Toluene (41.0) Ethylbenzene (0.5) Styrene (0.5) 1,3,5-Trimethylbenzene (0.4) 1,2,4-Trimethylbenzene (2.0) 1,4-Dichlorobenzene (4.0)
R & R Sprouts 12633 Los Nietos Rd. Date of Inspection: 1/7/98	This business grows alfalfa sprouts for juice bars. The only chemicals used in this business is chlorine bleach to clean tanks. No solvents or oils are used in this building.		Dichlorofluoromethane (1.0) Trichlorofluoromethane (0.7) Methylene chloride (2.0) Styrene (0.3) 1,3,5-Trimethylbenzene (0.3)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Stansel Brothers 12635 Los Nietos Rd. Date of Inspection: 1/7/98	According to the site operator, their business uses acetone, cutting oil, WD-40, Sup-'N'-Kleen Aerosol (contains isobutane, ethylene glycol, and monobutyl ether. Site personnel provided the MSDS's for other chemicals used at his business. The following information was provided in the MSDS'S: Zap ESP (General Purpose Cleaner) - contains d-propylene glycol methyl ether (< 5 %). Shell Tetius Oil 32 (industrial oil) - contains Shell Tellus Oil and solvent refined, hydrotreated heavy paraffinic distillate. Shell Tonna Oil 68 (lubricating oil) - contains Shell Tonna Oil 68; catalytic dewaxed heavy paraffinic distillate; and hydrotreated heavy paraffinic distillate. Dromus B (solvent refined petroleum grade). Garia Oil (cutting oil) (8% fatty oil). Kerosene (may contain sulfur and benzene)	Observed containers with naphtha and other degreasers. Spray cans with mold release agents were also observed.	Dichlorofluoromethane (7.0) **Vinyl Chloride (0.5) *** Trichlorofluoromethane (1.0) Methylene chloride (2.0) Chloroform (0.2) 1,1,1-Trichloroethane (3.0) Carbon tetrachloride (0.5) **Benzene (6.0) *** Trichloroethene (0.8) Toluene (66.0) Tetrachloroethene (0.8) Ethylbenzene (8.0) o-Xylene (12.0) Styrene (1.0) 1,1,2,2-Tetrachloroethane (1.0) 1,3,5-Trimethylbenzene (3.0) 1,2,4-Trimethylbenzene (1 2.0)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
Stansel Brothers (Duplicate Sample) 12635 Los Nietas Rd. Date of Inspection: 1/7/98	According to the site operator, their business uses acetone, cutting oil, WD-40, Sup-'N'-Kieen Aerosol (contains isobutane, ethylene glycol, and monbutyl ether. Site personnel provided the MSOS's for other chemicals used at his business. The following information was provided in the MSDS'S: Zap ESP (General Purpose Cleaner) - contains d-propylene glycol methyl ether (< 5%). She[[Tetlus Oil 32 (industrial oil) - contains Shell Tellus Oil and solvent refined, hydrotreated heavy paraffinic distillate. Shell Tonna Oil 68 (lubricating oil) - contains Shell Tonna Oil 68; catalytic dewaxed heavy paraffinic distillate; and hydrotreated heavy paraffinic distillate. Dromus B (solvent refined petroleum grade). Garia Oil (cutting oil) (8% fatty oil). Kerosene (may contain sulfur and benzene)		Dichloroflouromethane (6.0) Trichloroflcuromethane (0.6) Methylene chloride (2.0) Chloroform (0.2) 1,1,1-Trichloroethane (3.0) **Benzene (6.0)** Toluene (62.0) Tetrachloroethene (0.4) Ethylbenzenes (9.0) m&p-Xylene(s) (35.0) o-Xylene (1 3.0) Styrene (0.4) 1,3,5-Trimethylbenzene (4.0) 1,2,4-Trimethylbenzene (12.0)
Timmons Wood Products Date of Inspection: 1/7/98	No inspection performed.		Dichlorofluoromethane (1.0) Chloromethane (1.0) Bromomethane (0.2) Trichlorofluoromethane (0.6) Methylene chloride (2.0) 1,1,1-Tetrachloroethane (8.0) Trichloroethene (0.6) Toluene (140) 1,1,2-Trichloroethane (0.3) Ethylbenzene (8.0) m & p-Xylene(s) (5.0) o-Xylene (5.0) 1,3,5-Trimethylbenzene (0.4)

Table 8 (continued): Chemical inventory of buildings located on the Waste Disposal, Inc. Site (38)

Business	Chemical products used within the building (from USEPA Inventory)	Additional Chemicals Identified during In-Building Air Monitoring by TRC	Chemicals detected above background concentrations in indoor air (ppbv)
9618 #12 Santa Fe Springs Rd. Date of Inspection:	No inspection performed.		Dichlorofluoromethane (0.9) Chloromethane (6.0) Bromomethane (0.2) Trichlorofluoromethane (0.4) 1,1,2-Trichloro-1,2,2-trifluoroethane (0.3) Methylene chloride (1.0) Benzene (2.0) **Toluene (440)*** Tetrachloroethene (0.7) Ethylbenzene (0.7) Styrene (0.4) 1,3,5-Trimethylbenzene (0.3)
9618 #10 Santa Fe Springs Rd. Date of Inspection; 1/7/98	The site operator opened his business at this location approximately 2 months ago, His business was not operating at this building when the sample was collected.		Dichlorofluoromethane (0.8) Trichlorofluoromethane (0.4) Methylene chloride (1.0) Toluene (7.0) Tetrachloroethene (0.4) Ethylbenzene (0.5) 1,3,5-Trimethylbenzene (0.3)

Bolded asterisk* compounds were detected at concentrations above the indoor air threshold values.

TABLE 9: EXPOSURE PATHWAYS AT WASTE DISPOSAL, INC.

Pathway	Media	Exposure Point	Exposure Route	Exposed Populations	Time Frame	Status
Inhaling Contaminated Soil Gas	Soil Gas	Inside WDI Site buildings	Inhalation	On-Site workers	Past and Present	COMPLETED*
Drinking Contaminated groundwater	Groundwater	Sante Fe Springs municipal water	Ingestion, absorption and inhalation	People that consume water provided by the City of Sante Fe Springs	Future	POTENTIALLY COMPLETED
Inhaling Contaminated Soil Gas	Soil Gas	Inside WDI Site buildings	Inhalation	On-Site workers	Future	POTENTIALLY COMPLETED
Dermal Contact, Incidental Ingestion & Inhalation of contaminated wastes	WDI Wastes	On-Site wastes including shallow wastes in Area 5	Skin absorption, incidental ingestion and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Future	POTENTIALLY COMPLETED
Dermal Contact, Incidental Ingestion & Inhalation of contaminated wastes	WDI Wastes	On-Site wastes	Skin absorption, incidental ingestion and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Past**	POTENTIALLY COMPLETED
Dermal Contact, Incidental Ingestion & Inhalation of contaminated soils	Soil	On-site surface soils	Skin absorption, incidental ingestion, and inhalation	Workers, residents near WDI and St. Paul's School staff and students	Past, Present and Future	ELIMINATED
Inhaling Contaminated Soil Gas	Soil Gas	Off-site buildings	Inhalation	Residents near WDI and St. Paul's School staff and students	Past, Present and Future	ELIMINATED
Drinking Contaminated groundwater	Groundwater	Drinking water	Ingestion, absorption and inhalation	Workers, residents near WDI and St. Paul's School staff and students	Past and Present	ELIMINATED
WDI Site	WDI Wastes	On-site wastes	Skin absorption, incidental ingestion, and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Present	ELIMINATED

* The only completed exposure pathway does not appear to pose any occupational health risks.

** This pathway refers specifically to the time period before 1966, when the site was covered with 5-15 feet of fill.

Table 10: Elements of Potentially Completed Exposure Pathways

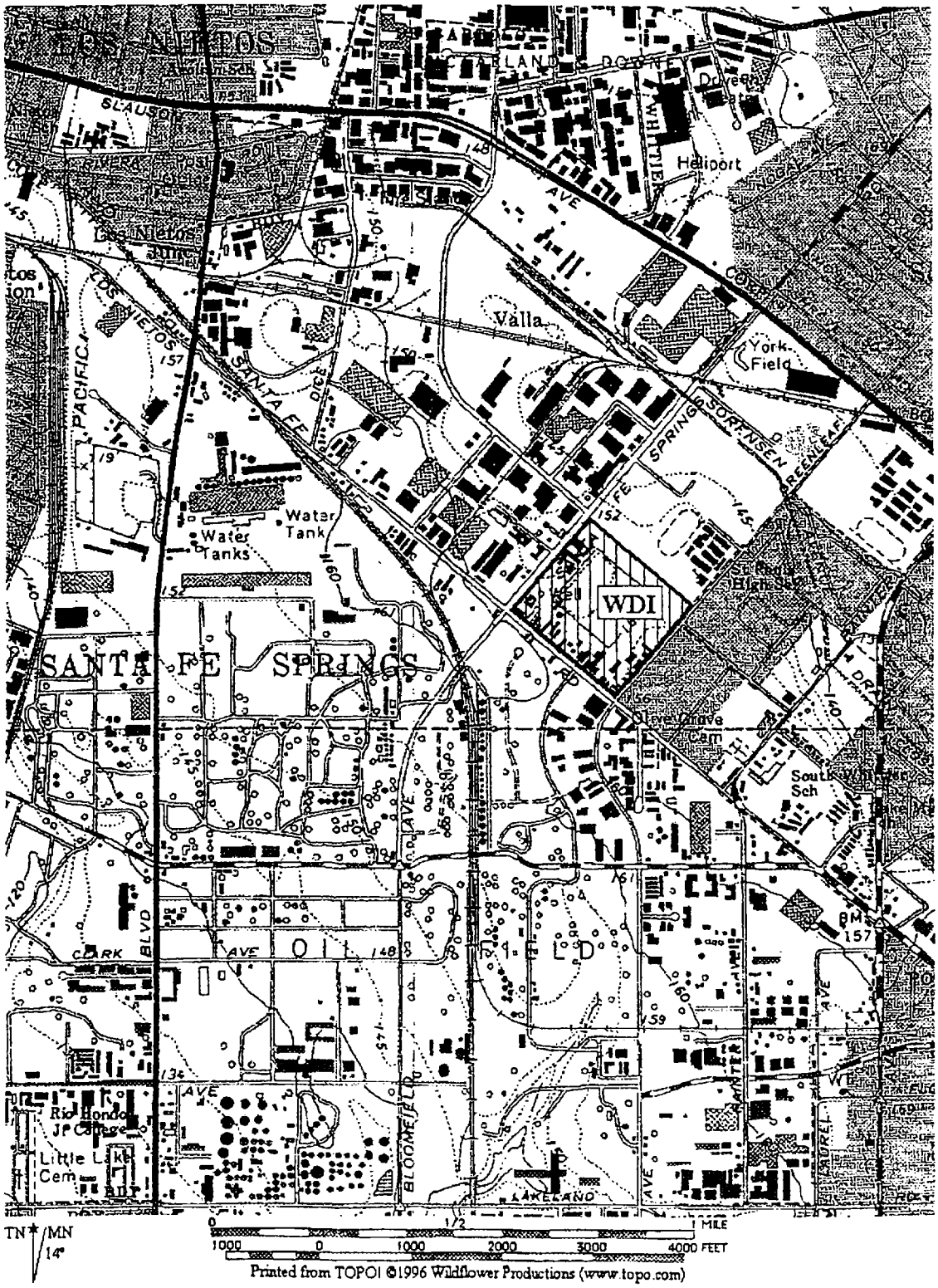
Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Populations	Time Frame
Off-Site Properties	Groundwater	Future municipal water provided by the City of Sante Fe Springs	Ingestion, absorption and inhalation	People that consume water provided by the City of Sante Fe Springs	Future
WDI Site	Soil Gas	Inside WDI Site buildings	Inhalation	On-Site workers	Past, Present and Future
WDI Site	Wastes in WDI Reservoir & sumps	On-Site wastes including shallow wastes in Area 5	Skin absorption, incidental ingestion and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Future
WDI Site	Wastes in WDI Reservoir & sumps	On-Site wastes	Skin absorption, incidental ingestion and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Pre-1966: before site was covered with fill

Table 11: Elements of Eliminated Exposure Pathways

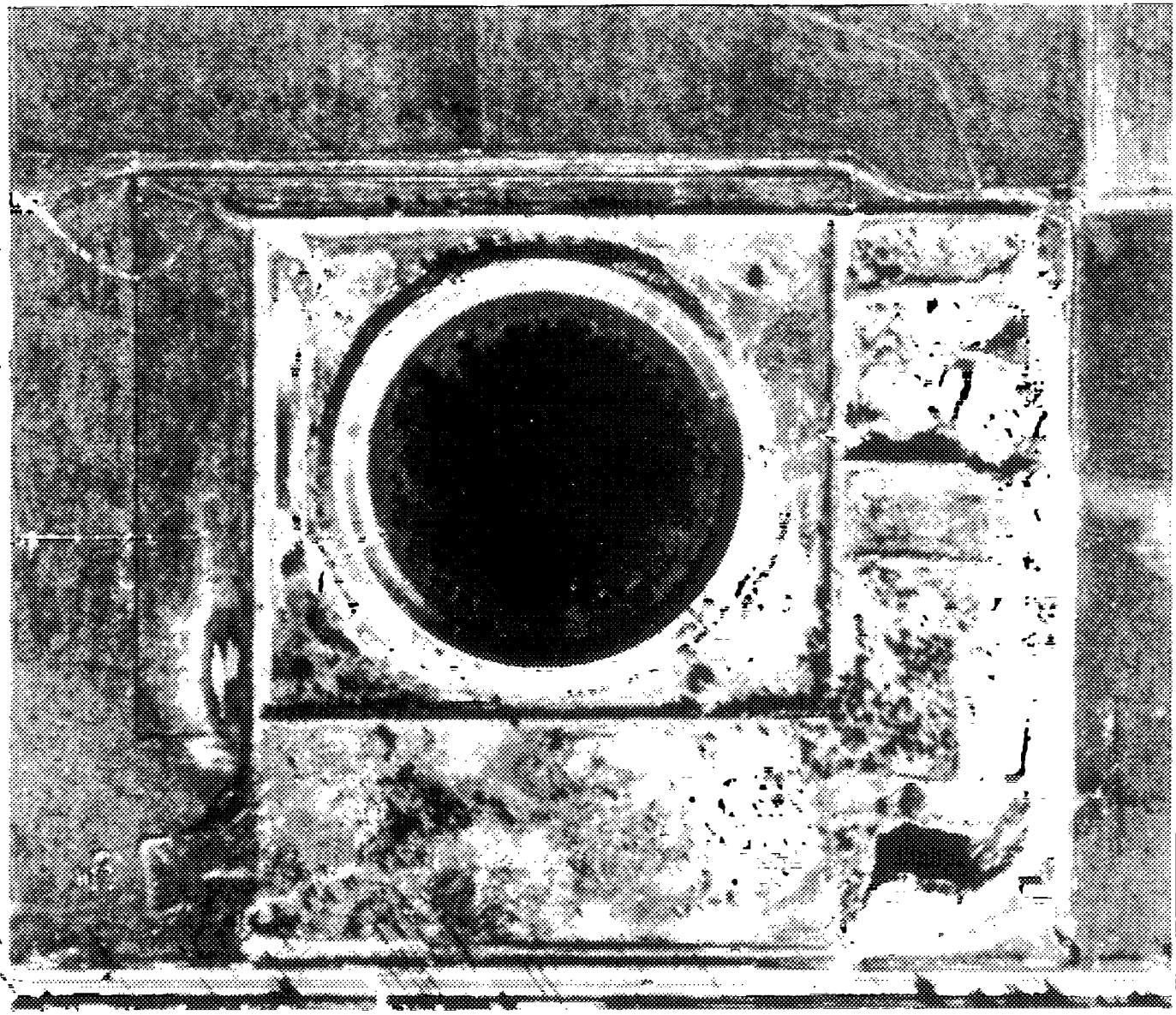
Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Populations	Time Frame
WDI Site	Soil	On-site surface soils	Skin absorption, incidental ingestion, and inhalation	Workers, residents near WDI and St. Paul's School staff and students	Past, Present and Future
WDI Site	Soil Gas	Off-site buildings	Inhalation	Residents near WDI and St. Paul's School staff and students	Past, Present and Future
Upgradient Properties	Groundwater	Drinking water	Ingestion, absorption and inhalation	Workers, residents near WDI and St. Paul's School staff and students	Past and Present
WDI Site	Wastes in WDI Reservoir & Sumps	On-site wastes	Skin absorption, incidental ingestion, and inhalation	On-site workers, residents near WDI and St. Paul's School staff and students	Present

Appendix C - Figures

Figure 1: Location of the Waste Disposal, Inc. Site [13]



Source: USGS, Whittier Quadrangle
7.5' Series Topographic



AERIAL PHOTOGRAPH
JANUARY 1, 1945

WASTE DISPOSAL, INC.
SANTA FE SPRINGS, CALIFORNIA

TRC | FIGURE I.8

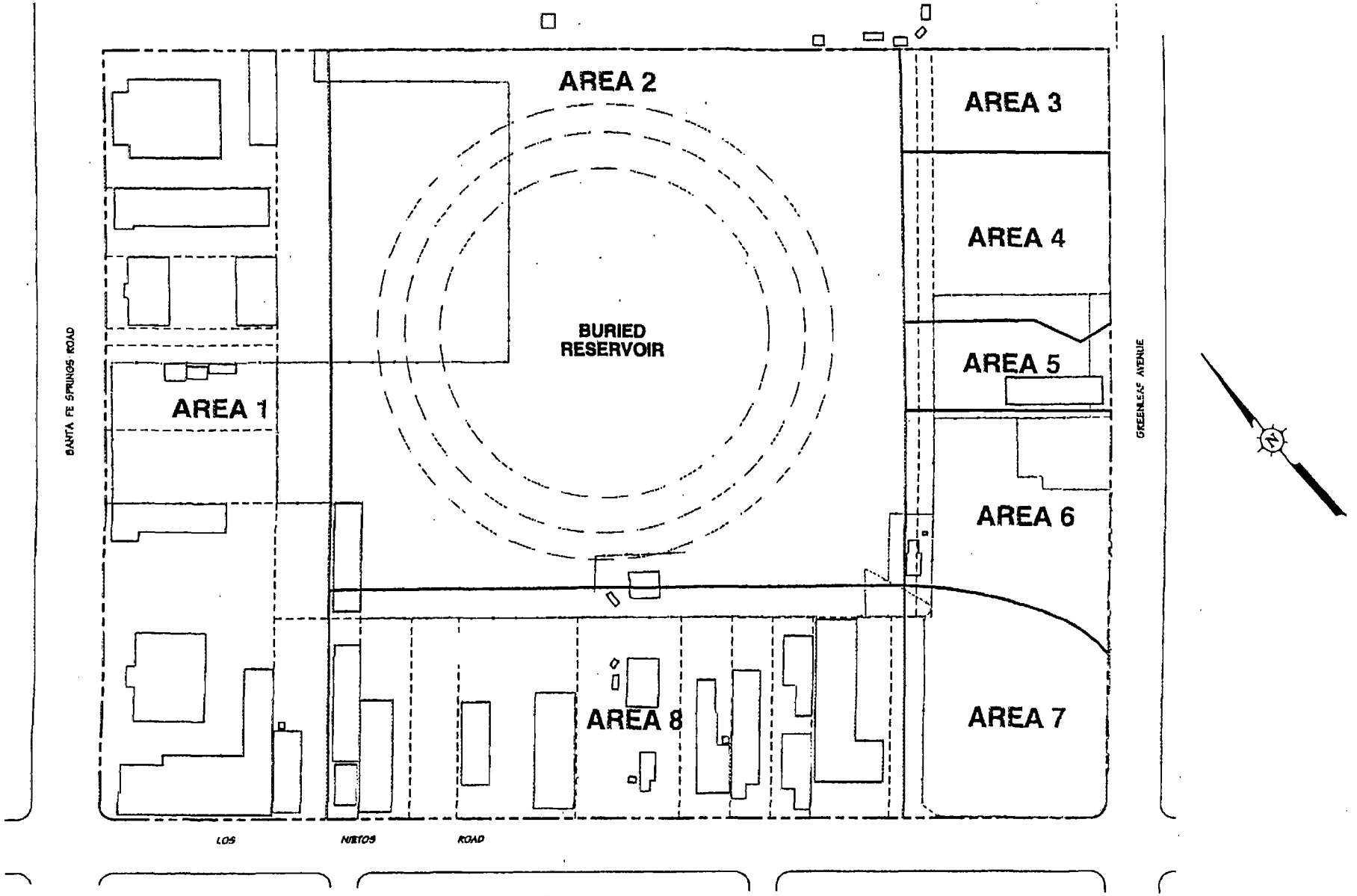

AREA 2
AREA 3
AREA 4
AREA 5
AREA 6
AREA 7
AREA 8
AREA 1
BURIED RESERVOIR
SANTA FE SPRINGS ROAD
GREENLEAF AVENUE
LOS NIETOS ROAD
LEGEND
SITE BOUNDARY
AREA BOUNDARY
FENCE
EXISTING BUILDING
0 200 400 FEET
SCALE
SITE PLAN
WASTE DISPOSAL, INC.
SANTA FE SPRINGS, CALIFORNIA
TRC
Figure 3

Figure 4 : **Site Map Depicting the Locations of the Vapor Wells at WDI**

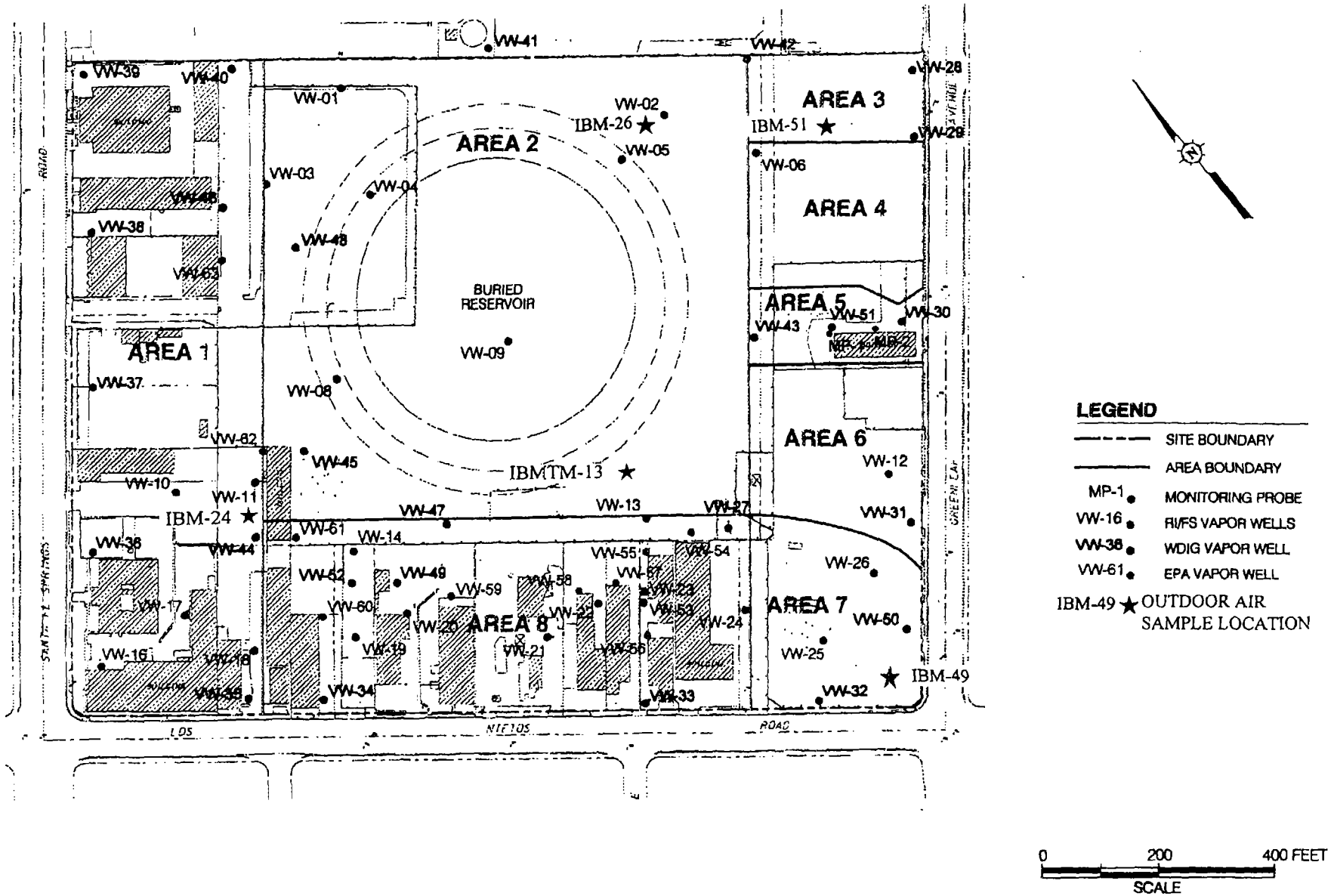
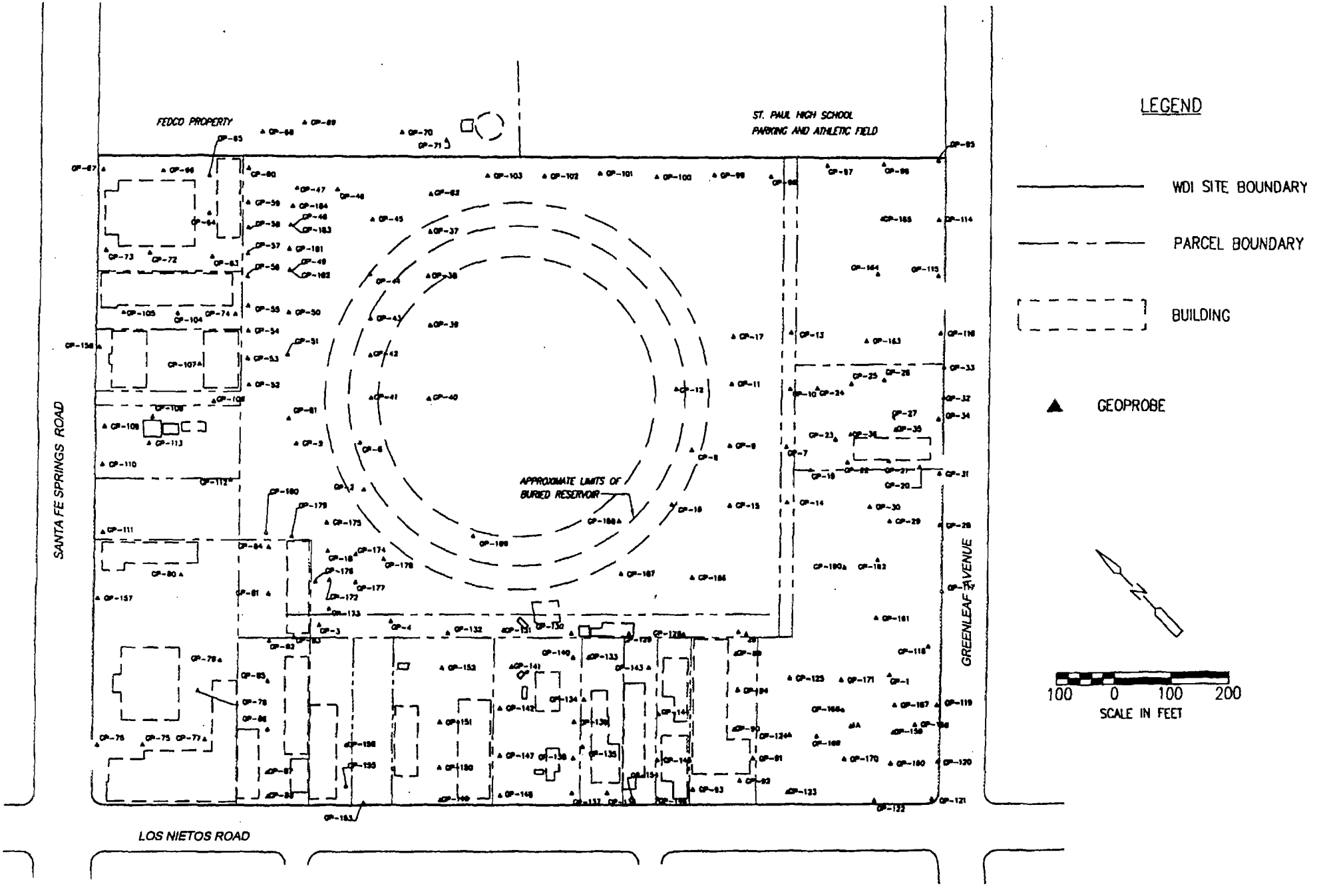


Figure 5: **Site Map Depicting the Locations of the Temporary Soil Gas Probes** [15]



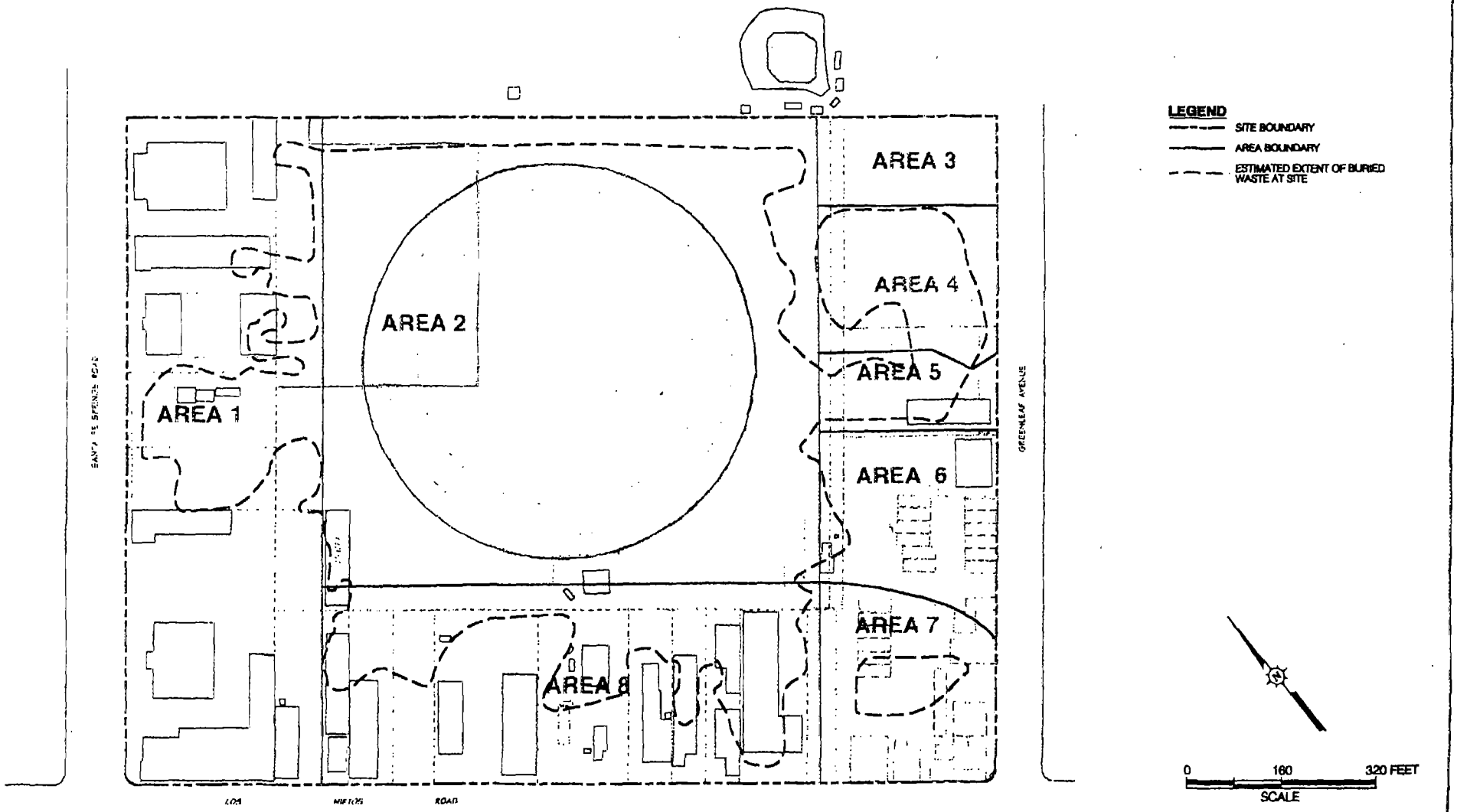
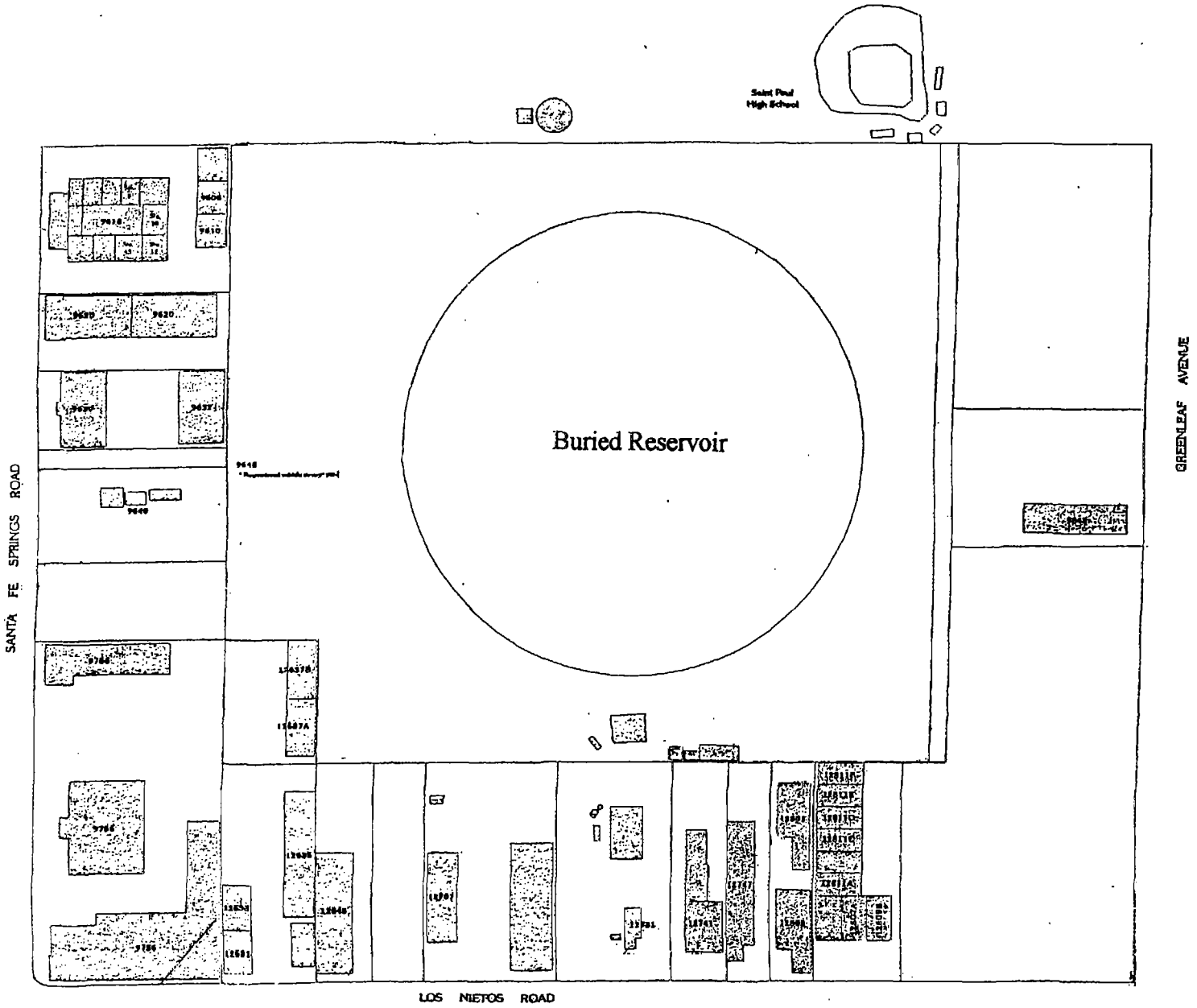


Figure 6
ESTIMATED EXTENT OF
BURIED WASTE AT
WASTE DISPOSAL, INC.

TRC

Figure 7: Businesses Located on the Waste Disposal Inc., Site as of 1999 [18]



Businesses Located on the Waste Disposal, Inc. Site

Rolland's Welding 9608 Santa Fe Springs Rd.
Lift Truck Converter 9610 Santa Fe Springs Rd.
Lovell Cabnets 9618 Santa Fe Springs Rd. Ste 15
Action Maintenance 9620Santa Fe Springs Rd.
Dry Print 9620 Santa Fe Springs Rd.
Gold Coast 9630 Santa Fe Springs Rd.
E & L Electric 9632 Santa Fe Springs Rd.
Marsita Equipment 9640 Santa Fe Springs Rd.
Air Liquide Bldg #1 9756 Santa Fe Springs Rd.
Air Liquide Bldg #2 9756 Santa Fe Springs Rd.
Air Liquide Bldg #3 9756 Santa Fe Springs Rd.
R & R Sprouts 12633 Los Nietos Rd.
Metro Diesel 12631 Los Nietos Rd.
Stansel Brothers 12635 Los Nietos Rd.
Buffalo Bullet 12707 Los Nietos Rd.
C&E Die Fabrications 12637B Los Nietos Rd.
Bell Auto Body 12645 Los Nietos Rd.
D&H Laminating 12707 Los Nietos Rd.
Timmons Wood Prod. 12731 Los Nietos Rd.
Peoples 12741 Los Nietos Rd.
Dan Ray 12741 Los Nietos Rd.
California Reamer 12747 Los Nietos Rd.
Durango Plastic 12803 Los Nietos Rd.
Solomons Press Repair 12801 Los Nietos Rd.
Four C's Transmission 12807A Los Nietos Rd.
Bert's Auto 12809B Los Nietos Rd.
Storage Unit 12811A Los Nietos Rd.
Leo's Lawnmower 12811C Los Nietos Rd.
Hernandez Auto 12811 D Los Nietos Rd.
H & H Contractors 12811F Los Nietos Rd.
Brothers Machine 9483 Greenleaf Ave.

Appendix D - Comments Received on the Public Comment Draft PHA

Summary of the comments that were provided to the public comment draft PHA:

On December 17, 2002 CDHS had a conference call with TOSC to discuss some of their comments and concerns about the public comment draft of the WDI PHA. TOSC commented that they found the document thorough and that they generally supported the recommendations, especially continued air monitoring. However, they did have some questions. They were interested to know how CDHS conducted the cancer incidence review. We informed TOSC about the basic method used and agreed to provide further detail in the Health Outcome Data Evaluation Section (see page 35).

TOSC was also interested to see further clarification on the health risk evaluation done for the shallow wastes in Area 5. We agreed that a more detailed explanation of this assessment would be helpful and have included a more detailed description on page 31 and 32. TOSC was also interested to know how USEPA would follow up on our recommendations. We informed TOSC that although USEPA has no requirement to accept our recommendations, they generally try to incorporate as many components of our recommendations as possible.

There were several comments about the cancer incidence review that focused on the methods used to assess cancer in the neighborhood near WDI. Those issues generally revolved around the concern that if there were large sections of the Census tract that had no residences, would that potentially skew the results. In the revised text and via personal discussion, CDHS attempted to clarify that the cancer rates in any Census tract are based entirely on the total population of that tract, not on geographic area. Further, CDHS noted that an additional survey of cancer incidence based on the neighborhood across Greenleaf Avenue showed no apparent elevation in the types of cancer reported or the age of onset. (See Health Outcome Data Evaluation Section.)

A flyer on the public comment process was developed to summarize the important points of the Public Health Assessment. The flyer and the executive summary were provided to the Whittier Daily News for notification of the general public. The flyer and the executive summary were provided to USEPA and they were distributed to 375 people on their mailing list. Additionally, CDHS sent it to their mailing list of approximately 35 people. A presentation was done summarizing the PHA on January 14, 2003.